ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 148, 261, 268, 271, and 302

[SWH–FRL–6940–6]

RIN 2050–AE32

Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Paint Production Wastes; Land Disposal Restrictions for Newly Identified Wastes; CERCLA Hazardous Substance Designation and Reportable Quantities; Designation of n-Butyl Alcohol, Ethyl Benzene, Methyl Isobutyl Ketone, Styrene, and Xylenes as Appendix VIII Constituents; Addition of Acrylamide and Styrene to the Treatment Standards of F039; and Designation of Styrene as an Underlying Hazardous Constituent

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The EPA proposes to amend the regulations for hazardous waste management under the Resource Conservation and Recovery Act (RCRA) by listing as hazardous certain waste solids and liquids generated from the production of paint. EPA is proposing a concentration-based listing approach for each of these wastes. Under this approach, the identified paint production wastes are hazardous if they contain any of the constituents of concern at concentrations that meet or exceed regulatory levels. Generators must determine whether their wastes are listed hazardous wastes. If their wastes are below regulatory levels for all constituents of concern, then their wastes are nonhazardous. We are also proposing a contingent management option for waste liquids. These wastes would not be subject to the listing if they are stored or treated exclusively in tanks or containers prior to discharge to a publicly owned treatment works or discharged under a Clean Water Act national pollutant discharge elimination system permit. This proposal would also add the toxic constituents n-butyl alcohol, ethyl benzene, methyl isobutyl ketone, styrene, and xylenes found in these identified wastes to the list of constituents that serves as the basis for classifying wastes as hazardous, and to establish treatment standards for the wastes. Due to the uncertainties in our assessment of the management of paint manufacturing waste liquids in surface impoundments, we are also considering an alternative proposal not to list paint manufacturing waste liquids.

If these paint production wastes are listed as hazardous waste, then they will be subject to stringent management and treatment standards under Subtitle C of RCRA. Additionally, this action proposes to designate these wastes as hazardous substances subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and to adjust the one pound statutory reportable quantities (RQs) for these substances. Other actions proposed in this notice would add acrylamide and styrene to the treatment standards applicable to multisource leachate and designate styrene as an underlying hazardous constituent. As a result, a single waste code would continue to be applicable to multisource landfill leachates and residues of characteristic wastes would require treatment when styrene is present above the proposed land disposal standards.

DATES: EPA will accept public comments on this proposed rule until April 16, 2001. Comments postmarked after this date will be marked ''late'' and may not be considered. Any person may request a public hearing on this proposal by filing a request with Mr. David Bussard, whose address appears below, by February 27, 2001.

ADDRESSES: If you would like to file a request for a public hearing on this proposal, please submit your request to Mr. David Bussard at: Office of Solid Waste, Hazardous Waste Identification Division (5304W), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, (703) 308–8880.

If you wish to comment on this proposed rule, you must send an original and two copies of the comments referencing docket number F–2001–PMLP–FFFFF to: RCRA Docket Information Center, Office of Solid Waste (5305G), U.S. Environmental Protection Agency Headquarters (EPA, HQ), 1200 Pennsylvania Avenue, NW., Washington, DC 20460. Hand deliveries of comments should be made to the RCRA Information Center (RIC) located at Crystal Gateway, First Floor, 1235 Jefferson Davis Highway, Arlington, VA. You also may submit comments electronically by sending electronic mail through the Internet to: rcradocket@epa.gov. See the beginning of the Supplementary Information section for information on how to submit your comments as well as view public comments and supporting materials.

Please do not submit any confidential business information (CBI) electronically. You must submit an original and two copies of CBI under separate cover to: RCRA CBI Document Control Officer, Office of Solid Waste (5305W), U.S. EPA, 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

FOR FURTHER INFORMATION CONTACT: For general information, contact the RCRA Hotline at (800) 424–9346 or TDD (800) 553–7672 (hearing impaired). In the Washington, DC, metropolitan area, call (703) 412–9810 or TDD (703) 412–3323. For information on specific aspects of the rule, contact Ms. Patricia Cohn or Mr. David Carver of the Office of Solid Waste (5304W), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, (E-mail addresses and telephone numbers: cohn.patricia@epa.gov (703–308–8675); carver.david@epa.gov (703–308–8603)). For technical information on the CERCLA aspects of this rule, contact Ms. Lynn Beasley, Office of Emergency and Remedial Response, Analytical Operations and Data Quality Center (5204G), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, [E-mail address and telephone number: beasley.lynn@epa.gov (703–603–9086)].

SUPPLEMENTARY INFORMATION:

How Do I Submit Comments to This Proposed Rule?

We are asking prospective commenters to voluntarily submit one additional copy of their comments on labeled personal computer diskettes in ASCII (text) format or a word processing format that can be converted to ASCII (text). Specify on the disk label the word processing software and version/edition as well as the commenter's name. This will allow us to convert the comments into one of the word processing formats used by the Agency. Please use mailing envelopes designed to physically protect the submitted diskettes. We emphasize that submission of comments on diskettes is not mandatory, nor will it result in any advantage or disadvantage to any commenter.

If you submit comments electronically, identify comments in electronic format with the docket number F–2001–PMLP–FFFFF. You must submit all electronic comments as an ASCII (text) file, avoiding the use of special characters and any form of encryption.

How Can I View Supporting Documents for This Proposed Rule?

You may view either the paper or electronic form of public comments and supporting materials accompanying today's proposal. You may access the paper copies of these supporting documents in the RIC (See **ADDRESSES** section for address). The RIC is open from 9 am to 4 pm, Monday through Friday, excluding Federal holidays. To review docket materials, we recommend that you make an appointment by calling (703) 603–9230. You may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost $0.15/page.

You may also view these documents electronically on the Internet: *http://www.epa.gov/epaoswer/hazwaste/id/paint.*

We will keep the official record for this action in paper form. Accordingly, we will transfer all comments received electronically into paper form and place them in the official record, which will also include all comments submitted directly in writing. The official record is the paper record maintained at the address under **ADDRESSES** at the beginning of this document.

EPA responses to comments, whether the comments are written or electronic, will be in a notice in the **Federal Register** or in a response to comments document placed in the official record for this rulemaking. We may, however, seek clarification of electronic comments that become garbled in transmission or during conversion to paper form, as discussed above.

Customer Service

How Can I Influence EPA's Thinking on this Proposed Rule?

In developing this proposal, we tried to address the concerns of all our stakeholders. Your comments will help us improve this rule. We invite you to provide views on options we propose, new data, information on how this rule may affect you, or other relevant information. We welcome your views on all aspects of this proposed rule, but we particularly request comments on the items identified at the end of each section. Your comments will be most effective if you follow the suggestions below:

- Include your name, the date, and the docket number with your comments. Remember that your comments must be submitted by the deadline specified in this notice.
- Reference your comments to specific sections of the proposal by using section titles, page numbers of the preamble, or the regulatory citations.
- Clearly label any confidential business information (CBI) submitted as part of your comments.
- Explain your views as clearly as possible and provide a summary of the reasoning you used to arrive at your conclusions as well as examples to illustrate your views where possible.
- Tell us which parts of this proposal you support, as well as those with which you disagree.
- Offer specific alternatives.
- Provide solid technical data to support your views. For example, if you estimate potential costs, explain how you arrived at your estimate.

Contents of This Proposed Rule

I. Overview

A. Who Potentially Will be Affected by This Proposed Rule?

If finalized, this regulation could potentially affect those who generate and manage certain paint production wastes. Landfill owners/operators may also be impacted. A common disposal practice for much of the paint production wastes of concern has been in solid waste landfills. This proposed listing may result in leachate from some of these landfills becoming hazardous under the derived-from rule (described further in Section V.H). However, impacts to these facilities are projected to be negligible under our proposed approach of a Clean Water Act temporary deferral. This action may also affect entities that need to respond to releases of these wastes as CERCLA hazardous substances. These potentially affected entities are described in the Economics Background Document placed in the docket in support of today's proposed rule. A summary is provided in the table below.

SUMMARY OF FACILITIES POTENTIALLY AFFECTED BY EPA'S 2000 PAINT PRODUCTION WASTE LISTING PROPOSAL

Item	SIC code	NAICS code	Industry sector name	Estimated number of U.S. relevant facilities
1	2851	325510	Paint and Coating Manufacturing	972
2	4953	562212	Solid Waste Landfill	35–48

This list of potentially affected entities may not be exhaustive. Our aim is to provide a guide for readers regarding entities likely to be regulated by this action. This action, however, may affect other entities not listed in the table. To determine whether your facility is regulated by this action, you should examine 40 CFR parts 260 and 261 carefully along with the proposed rules amending RCRA that are found at the end of this **Federal Register** notice. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding section entitled FOR FURTHER INFORMATION CONTACT.

B. What Impact May This Proposed Rule Have?

If you are a paint manufacturer and you generate wastes described in this proposed rule, then you would need to determine if your wastes meet these newly listed hazardous waste codes, if finalized. Your waste would become a listed hazardous waste if it contains any of the constituents of concern at a concentration equal to or greater than the hazardous concentration identified for that constituent (see Tables IV–1 and IV–2). If you determine that your wastes are hazardous under this listing, then the wastes must be stored, treated and disposed in a manner consistent with the RCRA Subtitle C hazardous waste regulations at 40 CFR parts 260–272. If your annual generation of these paint production wastes exceeds 40 metric tons of waste solids and/or 100 metric tons of waste liquids, you must also perform certain routine testing of the affected wastes and keep certain records of these wastes (as described in Section V.E) on-site.

We are proposing that generators must meet the necessary conditions to determine whether or not a waste is hazardous based on the steps described in Section V.C, of today's proposed rule. If you determine that your wastes are hazardous under this listing, then you are also subject to all applicable requirements for hazardous waste generators in 40 part CFR 262. If you were not previously a hazardous waste generator, and you determine you generate this newly-listed hazardous waste; then you must notify the EPA, according to section 3010 of RCRA, that you generate hazardous waste. Following an initial determination whether your wastes are hazardous or nonhazardous under this listing, you would have a continuing obligation to make such a determination at least on an annual basis.

C. Why Does This Proposed Rule Read Differently From Other Listing Rules?

Today's proposed hazardous waste listing determination (or ''listing determination'') preamble and regulations are written in ''readable regulations'' format. The authors tried to use active rather than passive voice, plain language, a question-and-answer format, the pronouns ''we'' for EPA and ''you'' for the owner/generator, as well as other techniques, including an acronym list (see below), to make the information in today's proposed rule easier to read and understand. This new format is part of our efforts towards regulatory reinvention. We believe that this new format will help readers understand the regulations and foster better relationships between EPA and the regulated community.

ACRONYMS

Acronym	Definition
µm	Micrometer
BDAT	Best Demonstrated Available Technology
BFI	Browning-Ferris Industries (now Allied Waste Industries Inc.)
BHP	Biodegradation, hydrolysis and photolysis
BIF	Boiler and Industrial Furnace
BRS	Biennial Reporting System
CAA	Clean Air Act
CalEPA	California Environmental Protection Agency
CARBN	Carbon Absorption
CAS	Chemical Abstract Services
CBI	Confidential Business Information
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CHOXD	Chemical or Electrolytic Oxidation
CMBST	Combustion
COC	Constituents of Concern
CSCL	Chemical Stressor Concentration Limit
CSF	Cancer Slope Factor
CWA	Clean Water Act
CWT	Centralized Wastewater Treatment Facility (May also be referred to as a wastewater treatment facility, or WWTF)
EDF	Environmental Defense Fund
EO	Executive Order
EP	Extraction Procedure
EPA	Environmental Protection Agency
EPACMTP	EPA's Composite Model for Leachate Migration with Transformation Products
EPCRA	Emergency Planning and Community Right-To-Know Act
FR	Federal Register
GDP	Gross Domestic Product
GNP	Gross National Product
HAP	Hazardous Air Pollutant
HEAST	Health Effects Assessment Summary Table
HQ	Hazard Quotient
HSWA	Hazardous and Solid Waste Amendments
HWIR	Hazardous Waste Identification Rule
ICR	Information Collection Request
INC	Incineration
IRIS	Integrated Risk Information System
ISCST3	Industrial Source Complex-Short Term
LDR	Land Disposal Restriction
MACT	Maximum Achievable Control Technology
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
MLF	Municipal Landfill
MINTEQ	MINTEQ (model for geochemical equilibria in ground water)

ACRONYMS—Continued

Acronym	Definition
MINTEQA2	MINTEQA2 (model for geochemical equilibria in ground water) Geochemical speciation model; originally a combination of Mineral Equilibrium Model (MINEQL) and the thermodynamic database WATEQ3
MSDS	Material Safety Data Sheet
MSW	Municipal Solid Waste
MT	Metric Ton
NAICS	North American Industrial Classification System
NAPL	Non-Aqueous Phase Liquid
NCV	National Capacity Variance
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPCA	National Paint and Coatings Association
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRC	National Response Center
NTTAA	National Technology Transfer and Advancement Act
OEM	Original Equipment Manufacturing
OMB	Office of Management and Budget
OSW	Office of Solid Waste
OSWER	Office of Solid Waste and Emergency Response
OSWRO	Off-Site Waste and Recovery Operations
PBT	Persistent, Bioaccumulative and Toxic
POTW	Publicly Owned Treatment Works
ppm	Parts Per Million
PRA	Paperwork Reduction Act
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFA	Regulatory Flexibility Act
RfC	Reference Concentration
RfD	Reference Dose
RFSA	Regulatory Flexibility Screening Analysis
RIC	RCRA Information Center
RODS	Record of Decision System
RQ	Reportable Quantity
RTK	Right-To-Know
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SIC	Standard Industry Code
SOP	Standard Operating Procedure
SPIS	Superfund Public Information System
SW–846	Test Methods for Evaluating Solid Wastes
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TRI	Toxic Release Inventory
TSDF	Treatment, Storage and Disposal facility
TSDR	Toxic Substances and Disease Registry
TSS	Total Suspended Solids
UMRA	Unfunded Mandates Reform Act
USC	United States Code
USLE	Universal Soil Loss Equation
UTS	Universal Treatment Standard
VOC	Volatile Organic Compound
WETOX	Wet Air Oxidation
WMU	Waste Management Unit
WMX	WMX Technologies, Inc.

D. What Are The Statutory Authorities for This Proposed Rule?

These regulations are being proposed under the authority of sections 2002(a), 3001(b), 3001(e)(2), 3004(d)–(m), and 3007(a) of the Solid Waste Disposal Act, 42 U.S.C. 6912(a), 6921(b) and (e)(2), 6924(d)–(m), and 6927(a), as amended, most importantly by the Hazardous and Solid Waste Amendments of 1984 (HSWA). These statutes commonly are referred to as the Resource Conservation and Recovery Act (RCRA), and are codified at Volume 42 of the United States Code (U.S.C.), sections 6901 to 6992(k) (42 U.S.C. 6901–6992(k)).

Section 102(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9602(a) is the authority under which EPA is proposing amendments to 40 CFR part 302.

II. Background

A. How Does EPA Define a Hazardous Waste?

EPA's regulations establish two ways of identifying solid wastes as hazardous under RCRA. A waste may be considered hazardous if it exhibits certain hazardous properties (''characteristics'') or if it is included on a specific list of wastes EPA has determined are hazardous (''listing'' a waste as hazardous) because it was found to pose substantial present or potential hazards to human health or the environment. EPA's regulations in the Code of Federal Regulations (40 CFR) define four hazardous waste characteristic properties: Ignitability, corrosivity, reactivity, or toxicity (See 40 CFR 261.21–261.24). As a generator, you must determine whether or not a waste exhibits any of these characteristics by testing the waste, or by using your knowledge of the process that produced the waste (see § 262.11(c)). While you are not required to sample your waste, you will be subject to enforcement actions if you are found to be improperly managing materials that are characteristic hazardous waste.

EPA may also conduct a more specific assessment of a waste or category of wastes and ''list'' them if they meet criteria set out in 40 CFR 261.11. As described in § 261.11, we may list a waste as hazardous if it:

—Exhibits any of the characteristics noted above, i.e., ignitability, corrosivity, reactivity, or toxicity (261.11(a)(1));
—Is ''acutely'' hazardous, i.e., if they are fatal to humans or in animal studies at low doses, or otherwise capable of causing or significantly contributing to an increase in serious illness (261.11(a)(2)); or
—Is capable of posing a substantial present or potential hazard to human health or the environment when improperly managed (261.11(a)(3)).

Under the third criterion, at 40 CFR 261.11(a)(3), we may decide to list a waste as hazardous if it contains hazardous constituents identified in 40 CFR part 261, appendix VIII, and if, after considering the factors noted in this section of the regulations, we ''conclude that the waste is capable of posing a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.'' We place a chemical on the list of hazardous constituents on Appendix VIII only if scientific studies have shown a chemical has toxic effects on humans or other life forms. When listing a waste, we also add the hazardous constituents that serve as the basis for listing to 40 CFR part 261, appendix VII.

The regulations at 40 CFR 261.31 through 261.33 contain the various hazardous wastes the Agency has listed to date. Section 261.31 lists wastes generated from non-specific sources, known as ''F-wastes,'' and contains wastes that are usually generated by various industries or types of facilities, such as ''wastewater treatment sludges from electroplating operations'' (see code F006). Section 261.32 lists hazardous wastes generated from specific industry sources, known as ''K-wastes,'' such as ''Spent potliners from primary aluminum production'' (see code K088). Section 261.33 contains lists of commercial chemical products and other materials, known as ''P-wastes'' or ''U-wastes,'' that become hazardous wastes when they are discarded or intended to be discarded.

Today's proposed regulations would list certain paint production wastes as K-waste codes under § 261.32. We are also proposing to add constituents that serve as the basis for the proposed listings to Appendix VII as well as to add certain constituents to the list of Hazardous Constituents in Appendix VIII that are not already included.

''Derived-from'' and ''Mixture'' Rules

Residuals from the treatment, storage, or disposal of most listed hazardous wastes are also classified as hazardous wastes based on the ''derived-from'' rule (40 CFR 261.3(c)(2)(i)). For example, ash or other residuals generated from the treatment of a listed waste generally carries the original hazardous waste code and is subject to the hazardous waste regulations. Also, the ''mixture'' rule (40 CFR 261.3(a)(2)(iii) and (iv)) provides that, with certain limited exceptions, any mixture of a listed hazardous waste and a solid waste is itself a RCRA hazardous waste.

Some materials that would otherwise be classified as hazardous wastes under the rules described above are excluded from jurisdiction under RCRA if they are recycled in certain ways. The current definition of solid waste at 40 CFR 261.2 excludes from the definition of solid waste secondary materials that are used directly (*i.e.,* without reclamation) as ingredients in manufacturing processes to make new products, used directly as effective substitutes for commercial products, or returned directly to the original process from which they are generated as a substitute for raw material feedstock. (See 40 CFR 261.2(e).) As discussed in the January 4, 1985, rulemaking that promulgated this regulatory framework, these are activities which, as a general matter, resemble ongoing manufacturing operations more than conventional waste management and so are more appropriately classified as not involving solid wastes. (See 50 FR 637–640).

B. How Does EPA Regulate RCRA Hazardous Wastes?

If a waste exhibits a hazardous characteristic or is listed as a hazardous waste then it is subject to federal requirements under RCRA. These regulations affect persons who generate, transport, treat, store or dispose of such waste. Facilities that must meet hazardous waste management requirements, including the need to obtain permits to operate, commonly are referred to as ''Subtitle C'' facilities. Subtitle C is Congress' original statutory designation for that part of RCRA that directs EPA to issue regulations for hazardous wastes as may be necessary to protect human health or the environment. EPA standards and procedural regulations implementing Subtitle C are found generally at 40 CFR parts 260 through 272.

All RCRA hazardous wastes are also hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as defined in section 101(14)(C) of the CERCLA statute. This applies to wastes listed in §§ 261.31 through 261.33, as well as any wastes that exhibit a RCRA characteristic. Table 302.4 at 40 CFR 302.4 lists CERCLA hazardous substances along with their reportable quantities (RQs). Anyone spilling or releasing a substance at or above the RQ must report the release to the National Response Center, as required in CERCLA Section 103. In addition, Section 304 of the Emergency Planning and Community Right-to-Know Act (EPCRA) requires facilities to report the release of a CERCLA hazardous substance at or above its RQ to State and local authorities. Today's rule proposes to establish RQs for the newly listed wastes.

C. How Does EPA Regulate Solid Wastes That Are Not RCRA Hazardous Wastes?

If your waste is a solid waste but is not, or is determined not to be a listed and/or characteristic hazardous waste, then you may dispose these solid wastes at Subtitle D facilities. These facilities are approved by state and local governments and generally impose less stringent requirements on management of wastes. Subtitle D is the statutory designation for that part of RCRA that deals with disposal of solid waste. EPA regulations affecting Subtitle D facilities are found at 40 CFR parts 240 thru 247, and 255 thru 258. Regulations for Subtitle D landfills that accept municipal waste (''municipal solid waste landfills'') are in 40 CFR part 258.

D. Overview of the Hazardous Waste Listing Determination Process for Paint Production Wastes

1. Suspension of Previous Listings

Under the Resource Conservation and Recovery Act (RCRA) of 1976, Congress directed EPA to establish a framework for RCRA's Subtitle C hazardous waste program. Congress also required EPA to propose and write timely rules identifying wastes as hazardous under Subtitle C. EPA responded by proposing Subtitle C regulations on December 12, 1978 (43 FR 58957) which established a framework for the Subtitle C program. At the same time, EPA also proposed to list wastes—including four paint production waste streams from specific (paint production) sources and two paint production waste streams from non-specific (paint application) sources—as hazardous. On July 16, 1980, EPA promulgated an interim final rule (45 FR 47832) that designated four paint production waste streams from specific sources as hazardous waste under 40 CFR 261.32:

- Solvent cleaning wastes from equipment and tank cleaning operations (K078),
- Water/caustic cleaning wastes from equipment and tank cleaning operations (K079),
- Wastewater treatment sludge (K081), and
- Emission control dust or sludge (K082).

Commenters to this rule argued that these listings were overly broad. EPA consequently re-examined the data and initial analysis on these paint production waste streams and determined that further study of these wastes was necessary before a final listing could be promulgated. On January 16, 1981, this interim final rule—identifying and listing these paint production waste streams as hazardous—was temporarily suspended (48 FR 4614).

2. Consent Decree Schedule for This Proposal

The 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA require EPA to make listing determinations for paint production wastes (see RCRA section 3001(e)(2)). In 1989, the Environmental Defense Fund (EDF) filed a lawsuit to enforce the statutory deadlines for listing decisions in RCRA section 3001(e)(2). (*EDF* v. *Browner*, D.D.C. Civ. No. 89–0598). To resolve most of the issues in the case, EDF and EPA entered into a consent decree, which has been amended several times to revise deadlines for EPA action. Paragraph 1.d (as amended) of the consent decree addresses the paint production industry:

> EPA shall promulgate a final listing determination for paint production wastes on or before March 30, 2002. This listing determination shall be proposed for public comment on or before January 28, 2001. This listing determination shall include the following wastes: solvent cleaning wastes (K078), water/caustic cleaning wastes (K079), wastewater treatment sludge (K081), and emission control dust or sludge (K082) for which listings were suspended on January 16, 1981 (46 FR 4614), and off-specification production wastes.

Today's proposal satisfies EPA's duty under paragraph 1.d to propose determinations for the specified paint production wastes.

E. Existing Regulations That Apply to This Industry

RCRA authorizes EPA to evaluate industry waste management practices and, if necessary, regulate how wastes are handled to ensure that present or potential hazards are not posed to human health and the environment. In addition to RCRA, the Clean Water Act (CWA) and Clean Air Act (CAA) provide EPA with the statutory authority to evaluate industry practices and, if necessary, regulate industry releases of pollutants to environmental media such as water and air.

Currently, there are no regulatory requirements under RCRA that specifically—identify paint production waste streams as listed hazardous waste. Paint production waste streams may, however, carry hazardous waste listing and/or characteristic codes if they are generated from the use of certain common organic solvents (spent solvent wastes F001 through F005) or if they exhibit a hazardous waste characteristic (ignitability—D001, corrosivity—D002, reactivity—D003, toxicity—D004—D043). EPA is not soliciting comment on these existing hazardous waste listings and does not intend to respond to such comments if received. As well, paint production wastes subject to today's proposal remain subject to current hazardous waste listings or characteristics that render them hazardous.

Regulatory requirements under the CWA (40 CFR part 446) specify effluent guidelines implemented through national pollutant discharge elimination system (NPDES) permits for certain paint production wastes that are discharged to navigable waters. These regulations apply to paint production wastes that originate from the production of oil-based paint where tank cleaning is performed using solvents. In addition, manufacturers who discharge wastewaters generated from paint production to a publicly owned treatment works (POTW) may be required to comply with general pretreatment requirements (40 CFR part 403) as established by the POTW. Finally, some paint manufacturers send their wastewaters to privately-owned centralized wastewater treatment facilities (CWTs) that are operated under NPDES permits. The Agency recently promulgated effluent guidelines for these facilities at 40 CFR part 437.

Under the CAA there are two types of regulatory requirements that may apply specifically to paint production wastes: National volatile organic compound (VOC) emission standards and national emission standards for hazardous air pollutants (NESHAP). VOC emission standards—which aim to reduce VOC emissions and in turn reduce ozone levels—exist for architectural coatings (40 CFR part 59, subpart D; 63 FR 48848, September 11, 1998) and automobile refinish coatings (40 CFR part 59, subpart B; 63 FR 48806, September 11, 1998). These standards specify VOC levels for categories of architectural and automobile refinish coatings.

Subpart DD in 40 CFR part 63, sets NESHAPs from off-site waste and recovery operations (OSWRO). These standards, in part, limit air releases from off-site wastewater treatment facilities (CWTs) (July 1, 1996, 61 FR 34140). Furthermore, EPA is planning to propose a MACT (Maximum Achievable Control Technology) standard for paint manufacturers (Miscellaneous Organic Chemical and Coatings Manufacturing) that would regulate hazardous air pollutant (HAP) emissions from process vents, storage tanks, transfer operations, equipment leaks, and wastewaters.[1] This would apply to wastewaters managed on-site and also if sent off-site for treatment.

F. What Industries and Wastes Are Covered in This Proposed Rule?

1. Scope of Consent Decree

Today's proposed rule applies to paint and coatings manufacturers generally categorized under subcodes 28511, 28512, and 28513 of Standard Industrial Code (SIC) 2851, or North American Industry Classification System (NAICS) 325510 (subcodes -1, -4, and -7). This includes, but is not limited to, entities who manufacture:

[1] These regulations would apply to coatings manufacturing facilities that are a major source and use, produce, or make a HAP. A major source of a HAP is located within a contiguous area and under common control and has the potential to emit greater than 9.1 Mg/yr (25 tons/yr) of any combination of HAP or 10 tons/yr of a single HAP.

paints (including undercoats, primers, finishes, sealers, enamels, refinish paints, and tinting bases), stains, varnishes (including lacquers), product finishes for original equipment manufacturing and industrial application, and coatings (including special purpose coatings and powder coatings). Products produced by this industry that are included within the scope of this proposed rule are referred to as ''paints'' and/or ''coatings.''

Today's proposal does not apply to miscellaneous allied products (paint and varnish removers, thinners for lacquers and other solvent-based paint products, pigment dispersions or putty) included under SIC subcode 28515 (NAICS 325510A) or artist paint, which is classified under SIC 3952 (NAICS 339942).

The waste streams included within the scope of today's proposal are the following paint production wastes generated by paint manufacturers: (1) Solvent cleaning wastes as waste liquids and solids generated from equipment and tank cleaning operations; (2) water and/or caustic cleaning wastes as waste liquids and solids generated from equipment and tank cleaning operations; (3) wastewater treatment sludge as waste solids generated in on-site or captive wastewater treatment processes solely or primarily for treating paint production waste liquids; (4) emission control dust or sludge as waste solids collected in a facility's particulate emission control devices such as baghouses; and (5) off-specification production wastes as waste solids.

EPA bases many of its decisions as to the scope of the industries and wastes covered in this proposal on the *EDF* v. *Browner* consent decree. Paragraph 1.d of the consent decree states:

> *Paint production wastes*—EPA shall promulgate a final listing determination for paint production wastes on or before March 30, 2002. This listing determination shall be proposed for comment on or before January 28, 2001. This listing determination shall include the following wastes: solvent cleaning wastes (K078), water/caustic cleaning wastes (K079), wastewater treatment sludge (K081), and emission control dust or sludge (K082) *for which listings were suspended on January 16, 1981 (46 FR 4614)*, and off-specification production wastes. (Emphasis added)

For solvent cleaning wastes, water/caustic cleaning wastes, wastewater treatment sludge and emission control sludge or dust, we believe that the decree requires us to address only those industries and wastes included in the paint production wastes listing that the Agency suspended on January 16, 1981. After reviewing the original rulemaking record for the suspended interim final rule, we have determined that while EPA did initially look at the entire paint and coatings SIC classification, which included miscellaneous allied products, we ultimately narrowed the scope of the suspended paint listings to exclude this category. Therefore, manufacturers of allied products and allied products production wastes are not covered by the decree. Moreover, nothing in the 1980 rulemaking record suggests that artist materials were considered in this earlier listing development work. Therefore, EPA does not interpret the decree to require assessment of solvent cleaning wastes, water/caustic cleaning wastes, wastewater treatment sludge, and emission control sludge or dust from the production of artist paint. (For more information on how EPA determined the scope of the suspended paint listings, refer to the accompanying Listing Background Document.)

Concerning ''off-specification production waste,'' we believe that the most straightforward reading of the consent decree is that this waste stream, although not part of the suspended listings, has the same scope as the other enumerated waste streams. In other words, the decree does not require us to address off-specification allied products and artist paints. Nothing in the decree suggests that either party intended the off-specification production waste stream to apply more narrowly or more broadly than the other waste streams. Thus, EPA has assessed only off-specification paint production wastes from subcodes 28511, 28512, and 28513 of Standard Industrial Code (SIC) 2851.

EPA, however, interprets the decree to exclude off-specification paint products that have been shipped out to retailers or paint users. EPA believes that these downstream entities do not engage in paint production. Consequently, EPA has not evaluated off-specification paint which a downstream entity decides to discard or send back to the manufacturer. Moreover, as explained below, EPA thinks that downstream entities can presume that unused paint products returned to a paint production facility will be legitimately reused and, thus, will not be solid wastes, even if they exhibit a hazardous waste characteristic.

2. Scope of Listing: Off-Specification Products

EPA is proposing to include within the category of off-specification paints all products which a paint manufacturer decides not to use—whether or not the paint product meets applicable product specifications. Not all of these unused products literally fail to meet product specifications; paint producers cite a variety of reasons for deciding not to sell them as originally intended. EPA believes that any unused products, whatever the reason they are unused, could present similar risks. Moreover, facilities would find it cumbersome to distinguish between off-specification products and other unused products.

EPA is proposing not to go beyond the scope of the consent decree to include within the listing off-specification paint products which retailers or users decide to discard or return to manufacturers. However, EPA is proposing to go beyond consent decree requirements to include within the scope of today's proposed listing returned, unused products once a manufacturer obtains possession or control of them. EPA believes that ''returned'' unused products could pose risks similar to those posed by unused products that never go off-site. And, as discussed above, facilities would find it cumbersome to distinguish between returned products and ''never sent'' products. EPA refers to all of these unused products that will not be sold for their original, intended use as ''off-specification'' paint products.

3. Recycling Issues

EPA notes that off-specification paint production wastes can be recycled in ways that will not be regulated as hazardous waste management. Under current regulations defining ''solid wastes,'' unused paint reused as a legitimate ingredient in the manufacture of other paint is not considered a ''waste'' and thus will not be subject to the hazardous waste regulations. EPA notes that paint manufacturers commonly reuse unused products to make new paints. EPA also understands that paint formulations are fairly exacting, making it unlikely that a manufacturer could successfully rework paint containing significant quantities of constituents that are not useful paint ingredients. Typically, this type of reuse of a commercial product (when legitimate) is not regulated as waste management, even if it involves reclamation. See 40 CFR 261.2 [2] In addition, relatively small quantities are sold for ''lower-grade'' uses; these materials are still paint products, and no aspect of this activity is regulated under RCRA Subtitle C.

EPA wants to clarify the effect of today's proposed listing on ''take-back''

[2] See also: Letter from Sylvia K. Lowrance to Mark Schultz, May 16, 1991. This letter says that returned pharmaceutical products are not considered solid wastes until a decision is made to discard them, because use/reuse is generally a viable option.

programs in which retailers or customers return unused paint because it does not meet the customer's specifications or because it is unusable for some other reason. EPA believes, based on what it knows of the industry, that a retailer or customer returning unused paint to a paint manufacturer can presume that the paint will be legitimately used as an ingredient and that, therefore, the paint being returned is not a hazardous waste even if it exhibits a hazardous waste characteristic. EPA understands that paint manufacturers will typically take such returned paint and use it as a legitimate ingredient in the manufacture of another paint product. The retailer or user will be entitled to rely on this interpretation exempting returned paint even if the manufacturer ultimately decides to discard the unused paint rather than reuse it. EPA has previously taken the position that retailers or users of pharmaceutical products returning unused products to manufacturers are not managing wastes [3]. However, should the paint production facility determine it cannot or will not use the returned paint as an ingredient, we are proposing that the paint would then become an off-specification paint product waste that would need to be evaluated against the concentrations proposed in today's rulemaking, as well as the hazardous waste characteristics.

G. Description of The Paint and Coatings Industry

Paint and coatings manufacturers are concentrated near large metropolitan areas, with the majority of facilities located on the East Coast, and in California, Texas and the Midwest. We estimate that there are 972 paint and coatings manufacturing facilities operated in the United States by about 780 different companies (a few larger companies operate several facilities). For more information on how we estimated this universe, refer to Section II.H. Of this universe, we estimate that about 95 percent of all these companies meet the Small Business Administration definition of a small business (total company employment of fewer than 500 people, at the parent level, if a company is a subsidiary). We estimate that around 600 facilities are generating wastes that fall within the scope of this rulemaking.

The paint and coatings industry is classified by the type of paint product manufactured. Products are categorized into three main groups according to end use by the SIC classification as architectural coatings, original equipment manufacturing (OEM) product finishes, and special purpose coatings. Architectural coatings, also referred to as trade sales paints, include exterior and interior house paints, stains, varnishes, undercoats, primers, and sealers. OEM product finishes are custom formulated for application to products during the manufacturing process. This includes coatings applied to automobiles, appliances, machinery and equipment, toys and sporting goods, wood furniture and fixtures, coil coatings, electrical insulation, factory-finished wood, metal containers, paper, film and foil, and non-automotive transportation. Special purpose paints are formulated for specific applications or extreme environmental conditions (fumes, chemicals, and temperature) and include: high-performance maintenance coatings (used in refineries, public utilities, bridges, etc.); automotive refinishing; highway traffic markings; aerosol paints; and marine coatings.

Paint Production. Paints and coatings are formulated to protect and decorate surfaces as well as enhance desired surface properties such as electrical conductivity and corrosion protection. Inorganic and organic chemicals comprise raw materials—solvents, resins (or ''binders''), pigments, and additives—that are mixed in a batch process to make solvent or water-based paint according to desired end-use specifications. Batches of paint, which may range in size from 10 to 10,000 gallons, are blended in stationary and portable equipment such as mixers, blenders, sand mills, and tanks.

Paint Production Waste Generation and Management. Process equipment is cleaned regularly to avoid product contamination and to restore operational efficiency. The equipment is also cleaned during manufacturing shut downs and when a significant change in a production line occurs. Because paint is a mixture of chemicals that does not involve chemical reactions, the make-up of paint production wastes reflects chemicals used in batch production and any ancillary chemicals such as those used in cleaning process equipment. Depending on the type of paint manufactured, process equipment may be cleaned with either solvent, water, or aqueous caustic washes. These liquid cleaning wastes consist of paint solids and sludges which may contain pigments, partially or completely cured resins, and additives. Solvent cleaning wastes, as well as water and/or caustic cleaning wastes are defined by the type of cleaning reagent used, not by the material that is being removed through the cleaning process. For example, you can generate a solvent cleaning waste if you clean a wastewater tank with a solvent (or blend of solvent).

Paint manufacturing facilities may also generate waste solids and liquids included within the scope of this proposed rule when (1) emission control systems are emptied, (2) wastewaters are treated and (3) off-specification product is discarded. Airborne material is generated when dry materials, such as pigments, are loaded into processing equipment. Air hoods and exhaust fans help control the level of airborne particulate material released into the paint production areas. Material is collected in emission control systems such as baghouses. Pigments comprise a large fraction of the dry materials collected in emission control systems. Other raw materials, including additives (such as fillers) and solvents, may also be collected in emission control systems.

Water-based wastewaters are primarily generated when process equipment is cleaned. Additional sources include floor washdown and spill cleanup. The most common treatment for these wastewaters is physical-chemical. This usually involves chemical addition and gravity settling of suspended solids which generates a liquid and sludge.

As discussed above in Section II.F, ''off-specification'' paint products subject to this listing determination include any unused paint products which a paint manufacturer decides to handle in a way that is regulated as waste management. A paint may be considered off-specification for a variety of reasons. For example, it may not meet the original design specifications; it may be replaced by a new superior production; or, the product's shelf life expires. As discussed earlier, off-specification paint products may be reworked into saleable materials or discarded. Off-specification product that is discarded by a paint manufacturer is subject to this listing.

Paint manufacturers may generate some or all of these wastes. Waste generation is a function, in part, of volume and type of paint produced, degree of automation, amount of recycling, and age of facility. Treating, handling, and disposing of these wastes are costs associated with paint production activities. Paint manufacturers strive to reduce and/or eliminate waste produced which in turn reduces overall costs and improves profitability and competitiveness.

[3] Letter from David Bussard to N.G. Kraul, February 23, 1993. This letter says that off-specification paint is a non-listed commercial product and not a solid waste when reclaimed.

H. What Information Did EPA Collect and Use?

Our primary sources of data to support this proposed listing determination are a questionnaire (or ''survey'') of the paint and coatings manufacturing industry and existing literature. We conducted a survey under authority of RCRA section 3007, 42 U.S.C. 6927.[4] As part of the survey development process, we went on ten site visits to paint manufacturing facilities throughout the country.

Please note that we did not sample waste streams generated by the paint and coatings industry to support this proposed listing determination. As discussed earlier, there are about 1000 paint manufacturing facilities in the U.S. paint and coatings industry. These facilities combine raw materials (chosen from a potential universe of several thousand constituents) in batch processes to manufacture products that meet market demands for a wide variety of architectural, original equipment manufacture and product coatings, and special purpose needs. Waste streams generated at a facility (the same or different facility) may vary significantly because the type of product manufactured, as well as raw materials used, vary significantly. As a result, we did not attempt to sample paint production wastes described in this proposal because we concluded it would be impractical to conduct a data collection effort that would account for the wide variety of individual paint products produced and the potential variability in the waste characteristics. Gathering sufficient samples to evaluate all potential paint production wastes would require a large commitment of scarce Agency resources that would have been beyond the reasonable scope of this rulemaking. In addition, an advantage of the concentration-based listing approach that we have used in this proposal is that it does not rely on extensive waste sampling. Instead, we are relying on publically available sources of information as well as data collected from survey responses to characterize the constituents likely to be present and the chemical and physical properties of paint manufacturing wastes.

1. Site Visits

To develop a better understanding of industry practices and as a basis for developing the industry survey, the Agency conducted site visits at ten paint manufacturing plants located throughout the country. When selecting sites, we considered: plant production size, type of manufacturing process, Toxic Release Inventory (or ''TRI'') waste release information, and plant location. The information we obtained from these visits (other than that for which a Confidential Business Information (CBI) claim has been made and sustained) is available for public review in the docket for this rulemaking. (For more information about CBI protection, please refer to 40 CFR part 2 subpart B.)

In particular, we collected information on: (1) Types of production and volume, (2) waste management units used, (3) how each residual was managed (as hazardous or not), (4) evidence of off-spec product storage and tracking system, (5) volume of each residual generated and form and how each is stored on-site, (6) management practices for each residual for both on-site and off-site (POTWs, tanks), (7) types of constituents used at plant, (8) reuse of solvent/washwater (e.g., washwater used as ingredient in next batch), (9) pollution prevention and waste minimization practices, (10) presence or absence of solvent recovery stills on-site, (11) presence or absence of any closed loop recycling practices, (12) any appearance of unsafe operating practices or disposal practices by facility, and (13) housekeeping practices on plant floor relative to waste generation and management.

We used information collected at these on-site visits combined with additional information provided by industry representatives to develop a RCRA 3007 survey. For example, we were able to include more appropriate questions on waste management practices and to distinguish wastes that are recycled more clearly. This survey requests information on waste generation and management practices.

2. Database of Paint Manufacturing Information From Published Sources

We also created an electronic Database of Paint Manufacturing Information from Published Sources that is available in the docket. The database consists of three modules. The Raw Materials Module contains information on different categories of raw materials that are combined to make paints. The Paint Formulations Module contains information on the concentrations of different raw materials in selected paint formulations. The Bibliography of Documents Module lists the published reference materials which were used as sources for other modules in the database. These sources include technical texts, journal articles, EPA and other government studies, and publications from paint industry trade organizations.

3. The RCRA Section 3007 Survey

a. *Overview*. The purpose of the survey was to gather information about nonhazardous and hazardous waste generation and management practices in the U.S. paint and coatings manufacturing industry. Specifically, we requested information on the five waste streams of concern (as outlined in the Consent Decree obligations, See Section II.D.2), waste characteristics, and waste management practices.

In addition to determining the content of the survey, we also evaluated whether it was necessary to conduct a census of the industry in order to accurately depict this industry's current waste generation and management practices. Due to the size of the paint manufacturing industry, and in consideration of our time and resource constraints, we could not conduct a full census of all the facilities in the industry. Therefore, we surveyed a sample of the universe rather than conduct a full census. Random sampling is a widely used statistical approach to collecting representative data from a large population. To ensure that this survey would provide the best overall coverage for various industry subsets and identify all significant waste management practices throughout the industry, we used accepted statistical sampling methods to achieve a 90% probability or confidence level that our survey would find a waste management activity utilized by at least one in 20 paint manufacturing facilities within the various categories of generators we identified via our literature search (discussed below). In other words, we determined a sample size such that it would be large enough to ensure a high certainty (90% likelihood) of identifying any waste management practices with more than 5% chance of occurrence. Using a statistical stratified random-sampling scheme[5] designed to represent

[4] See **Federal Register** notices 4 FR 46375 (August 25, 1999) and 64 FR 71135 (December 20, 1999) announcing EPA's data collection request submitted to the Office of Management and Budget (OMB). A copy of the questionnaire is available in the public docket for today's proposed rule. This information collection request was approved by the OMB, Clearance Number 2050–0168 (expiration date: June 30, 2001).

[5] Stratified random sampling is a statistical procedure that first dividends the sampling population into subpopulations or strata with respect to several characteristics such that within the individual strata there is as much homogeneity as possible, and then selects samples randomly from the individual strata. This procedure improves generalizations about the whole population and, if

Continued

paint production types, sales volumes and TRI reporting status, we selected sufficient paint manufacturing facilities from an industry database developed by Dun & Bradstreet, a company of The Dun & Bradstreet Corporation, 2000. We believe this sampling survey adequately covered the industry while reducing the burden imposed by the survey on the industry and reducing the time and money spent by the government in performing the survey.

Prior to finalizing the questionnaire, we conducted a pilot test by sending the questionnaire to three paint manufacturing facilities which were not included in the survey and modified the questionnaire based on their comments. Further, in order to assist the surveyed facilities in understanding and responding to the questionnaire, we established toll-free telephone and e-mail help lines, returned and answered their calls or messages expeditiously, and even helped some complete the questionnaire over the telephone. Note that, under RCRA section 3007, the surveyed facilities are required to provide accurate information and certify under penalty of law. However, to ensure accuracy and completeness, we conducted a quality assurance review of the information and data provided in the questionnaire responses, such as identifying data entry errors, missing data, and internal inconsistencies between answers. The review of each facility's response resulted in follow-up telephone calls and/or letters to some facilities seeking clarifications, corrections, and additional/missing data where needed. We entered data from the questionnaire responses into a database known as the Paint Residual Master Database, and conducted additional quality assurance reviews on the database. Hard copies of the questionnaire responses and a CD–ROM copy of the response database are available in the public docket for review.

We compiled and analyzed these data to develop a general assessment of the paint industry's waste generation and management practices. We also used these data for our risk assessment, economic analysis of the potential impacts of hazardous waste regulation, and Land Disposal Restrictions (LDR) and treatment and management capacity analyses.

b. *Structuring The Survey to Capture All The Wastes of Concern.* As indicated previously, the consent decree obligations require the Agency to make hazardous waste listing determinations on five types of paint production wastes. In the questionnaire, we classified these five waste streams into 20 specific residuals for more detailed waste characterization. These 20 residuals, including ten hazardous and ten nonhazardous under current Federal regulations, encompass liquid residual from solvent cleaning, sludge residual from solvent cleaning, liquid residual from wash water, sludge residual from wash water, liquid residual from caustic wash water, sludge residual from caustic wash water, sludges from wastewater treatment, emission control dust, emission control sludge, and off-specification product. As discussed later in Sections III and IV, we eventually used the detailed waste characterization information from the survey to divide the paint production waste streams of concern into waste solids and waste liquids for today's proposed listing.

c. *Identifying The Universe of Paint Manufacturing Facilities.* Initially, using a variety of industrial and business data sources described in the listing background document, we estimated that there are approximately one thousand paint manufacturing facilities of interest in the United States. We found no single, comprehensive listing of all paint manufacturing facilities. However, we identified the 1998–99 Dun & Bradstreet database as the data source that would provide the most thorough listing of paint manufacturers in the United States that was available in electronic format. We used the Dun & Bradstreet database to develop a sampling population and to stratify the sampling population into categories based on paint types and sales volumes. We also looked at the American Business Directories List of paint and allied product manufacturers and the 1999 Paint Red Book published by Cygnus Publishing, but found that they were less suitable to our needs for sampling stratification purposes. We found that there was insufficient information in the latter two databases for us to distinguish the types of paint production by facilities and whether some facilities were clearly out of scope and classify them into our desired paint production categories (architectural, OEM, etc.). The Dun & Bradstreet database includes a well defined and easily understandable breakdown of the various paint manufacturing types we used to classify them into OEM and architectural related paint categories, and eliminate those apparently of no interest to this listing determination. Specifically, each entry in the Dun & Bradstreet database is identified by an 8-digit code, with the first four being the same as SIC's and the next four proprietary to Dun & Bradstreet that represent the classifications of the facilities. The coding system used in the Dun & Bradstreet database provided the level of detail necessary to more accurately divide the paint industry into the necessary strata for our use.

d. *Constructing a Stratified Random Sample.* We stratified paint manufacturing facilities into various categories for this sampling survey because we expected we might find differences in waste generation and management practices among various types of paint producers (architectural, OEM, etc.) and by sampling the various categories we would be more likely to identify the full range of management practices. We also believed that larger facilities (with higher sales volumes) conduct more waste management activities, and smaller facilities (with lower sales volumes) tend to have more recycling or reuse efforts in order to compete in business. Furthermore, manufacturing facilities subject to the Toxic Release Inventory (TRI) [6] reporting are required to report annual releases of toxic chemicals to waste management units and environmental media. As such, we were particularly interested in SIC 2851 paint manufacturers that are listed under TRI because they would also likely provide more information on waste constituents and management practices of concern to this listing determination. Therefore, we stratified the facilities based on three categorization criteria: Paint types, sales volumes, and TRI status, as elaborated below.

In the Dun & Bradstreet database, we found a total of 1,764 facility entries identified under SIC 2851. We removed those entries that are either apparent non-paint manufacturers, or entries we determined that are outside of the scope of this listing determination, or entries we found impossible to identify for stratification purposes. In the end, we adopted the remaining 884 facilities as the sampling population for this survey.

Next, we stratified the 884 potential paint manufacturing facilities into 12 categories, based on the three categorization criteria discussed above: paint types; sales volumes (less than

properly executed, generally leads to a higher degree edition, Prentice-Hall, Inc., 1967.

[6] The Toxic Release Inventory (TRI) of routine and accidental releases of toxic chemicals to the environment reported by manufacturing facilities, established per Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986. Facilities conducting the specified manufacturing operations are required to report on releases of certain toxic chemicals into the air, water, and land provided certain conditions (having ten or more full-time employees, and manufacturing or processes over 25,000 pounds of the designated chemicals, etc.) are met.

five million dollars, five to twenty million dollars, and greater than twenty million dollars, based on the Census Bureau's figures); and TRI status (whether the facility reported under TRI in 1997). These 12 categories comprise large, medium, and small facilities of the following combinations: Architectural-related production and on the TRI list; OEM-related production and on the TRI list; architectural-related production and not on the TRI list; OEM-related production and not on the TRI list. Also note that three categories contained no facilities: medium architectural-related paint production and on the TRI list, large OEM-related paint production and on the TRI list, and medium OEM-related paint production and on the TRI list.

To select a sample from the 884 sampling population for distributing the questionnaire, we developed a stratified, statistical random-sampling scheme based on the above stratification process and using the hypergeometric probability formula described in Steel and Torrie,[7] such that the sample size would represent a 90% probability of capturing a waste management practice conducted by at least one in 20 facilities (discussed above). Under these criteria, higher percentages of facilities were selected in the medium and large facility categories. All selected facilities were then randomly chosen within the various categories to avoid bias when sending questionnaires to the surveyed facilities. This sampling approach reduced the probability of including known non-paint manufacturers or manufacturers not of interest to this rulemaking in the survey, and increased the chance of capturing sufficient waste management activities. Otherwise, more of the small facilities would have been surveyed, but large manufacturing facilities and TRI generators which would likely provide more waste management information could have been left out.

We developed a statistical weight for each category of surveyed facilities to extrapolate from those facilities we actually surveyed to the larger sampling population of 884 facilities. The weight for each surveyed facility in a category represents its relationship to the total number of facilities in the category. For example, we surveyed 28 facilities from a category of 34 facilities; 63 facilities from a category of 255 facilities; 13 facilities from a category of 99 facilities, etc. As a consequence, each of the 28 facilities sampled from the category of 34 facilities represents 1.2143 facilities (34 ÷ 28 = 1.2143); each of the 63 facilities sampled from the category of 255 represents 4.0476 facilities (255 ÷ 63 = 4.0476); and each of the 13 facilities sampled from the category of 99 represents 7.6154 facilities (99 ÷ 13 = 7.6154), etc. These numbers (1.2143, 4.0476, 7.6154, etc.) are the statistical weighting values (or weights) to be applied to each facility in each of the 12 categories for analysis of the collected data (such as waste quantities). For a detailed description of our statistical methodology and stratification process, see ''Supporting Statement—Information Collection Request for Paint Manufacturing Industry Waste Survey, Part B'' which was submitted to the OMB as part of the ICR for review and approval, and the listing background document available in the public docket for this proposed rule.

e. *Conducting The Survey and Analyzing The Results.* Using this stratified random-sampling scheme, we distributed the questionnaires in February and March of 2000 to a total of 299 facilities out of the sampling population of 884 from the Dun & Bradstreet database that we identified as the potentially impacted paint manufacturing facilities in the United States.

Of the 299 questionnaires we distributed, 292 facilities responded to the questionnaires. We found that in 1998, 187 of the survey respondents manufactured paint products of interest to this listing determination. Thirty six of these 187 facilities identified themselves as paint manufacturers, but in 1998 did not generate or dispose of any of the waste residuals within the scope of the questionnaire because they recycled or reused all paint residuals as feedstock in their manufacturing processes.[8] The other 151 manufacturing facilities generated one or more of the waste residuals of concern. They provided information on their waste generation and management practices. Most of these 151 manufacturing facilities also reused their waste residuals on-site to some extent, either as feedstock in the paint production or as an ongoing cleaning solution. The remaining respondents identified themselves as either a paint sales agent, a non-paint manufacturer, a non-paint manufacturer until after 1998, no longer a paint manufacturer, or a paint-related manufacturer not under the scope of the questionnaire. Table II.H.-1 provides a summary of the number of potential paint manufacturing facilities selected from the Dun & Bradstreet database, the number of facilities surveyed, the number of facilities responded, and the number of paint manufacturing facilities of interest found, in each category of facilities.

TABLE II.H.–1.—SUMMARY OF THE NUMBERS OF POTENTIAL PAINT MANUFACTURING FACILITIES SELECTED, SURVEYED, RESPONDED AND PAINT MANUFACTURING FACILITIES FOUND

Facility category	Number of selected Dun & Bradstreet facilities in category	Number of randomly sampled facilities in category	Number of survey respondents in category	Number of within-scope paint manufacturers found in category
Large, 2851–01, and TRI	2	2	2	2
Medium, 2851–01, and TRI	0	0	0	0
Small, 2851–01, and TRI	6	6	6	6
Large, 2851–01, and non-TRI	34	28	28	17
Medium, 2851–01, and non-TRI	62	48	47	42
Small, 2851–01, and non-TRI	379	77	75	44
Large, 2851–02, and TRI	0	0	0	0
Medium, 2851–02, and TRI	0	0	0	0

[7] Steel, Robert G.D. and James H. Torrie, ''Principles and Procedures of Statistics: A Biometrical Approach,'' 1980, Second Edition, McGraw-Hill, Inc.

[8] As stated in the questionnaire instructions, facilities were not required to report on any of the residuals that are used directly without reclamation as ingredients in manufacturing processes to make new products; or used directly as effective substitutes for commercial products; or returned directly to the original process from which they are generated as a substitute for raw feed stock. These residuals are excluded from the definition of solid waste. See 40 CFR 261.2.

TABLE II.H.–1.—SUMMARY OF THE NUMBERS OF POTENTIAL PAINT MANUFACTURING FACILITIES SELECTED, SURVEYED, RESPONDED AND PAINT MANUFACTURING FACILITIES FOUND—Continued

Facility category	Number of selected Dun & Bradstreet facilities in category	Number of randomly sampled facilities in category	Number of survey respondents in category	Number of within-scope paint manufacturers found in category
Small, 2851–02, and TRI	7	7	7	7
Large, 2851–02, and non-TRI	23	22	22	14
Medium, 2851–02, and non-TRI	47	34	34	24
Small, 2851–02, and non-TRI	324	75	71	31
Total number of facilities	884	299	292	187

We believe the Dun & Bradstreet database properly represents the paint manufacturing universe (notwithstanding the database inevitably includes some out-of-scope operations also listed under SIC 2851). We used sound, widely accepted statistical methods to construct our stratified random-sample covering the variety of paint manufacturing types, paint production wastes, and waste management practices of interest to this listing determination. Therefore, we believe the survey results are representative of the paint manufacturing facilities in the sampling population as well as the universe of paint manufacturers of interest. Furthermore, based on our sample quality review, data analysis, and intensive follow-up with survey respondents, we believe that the data collected from the 187 survey respondents are valid and reliable. Nevertheless, we specifically request data with which to evaluate our assumption that the Dun & Bradstreet database properly represents the paint manufacturing universe, as well as comments on our approach to sampling and extrapolation of sampling results.

We used survey data in three forms: (1) Direct survey responses representing only the surveyed population; (2) weighted data to extrapolate to the sampling population; and (3) data extrapolated to the universe of paint manufacturing.

We used survey responses directly when data extrapolation to the sampling population or the paint universe would not be necessary, such as the patterns of waste management practices (see Section III.D).

As previously discussed, we derived independent weighting values corresponding to the number of facilities represented by each surveyed facility in each category. If the total quantities of a certain residual generated by Category X facilities with a weight of 3.629 were 2,000 tons and by Category Y facilities with a weight of 8.8571 were 1,000 tons, and if facilities in the other categories did not report any, then the combined residual quantities generated by the entire sampling population of 884 can be calculated as 2,000 tons × 3.629 + 1,000 tons × 8.8571 = 16,115 tons. We used weighted waste quantities or volumes to represent the waste volumes sent from each facility in the sampling population to a particular management practice for input to our national risk modeling analysis. See discussions in Sections III.D and E.

Overall, 64% (*i.e.,* 187 ÷ 292) of the 292 respondents are paint manufacturing facilities of interest to this rulemaking. Proportionally, there should be 566 paint manufacturing facilities in the sampling population of 884 (from the Dun & Bradstreet database). As explained earlier, because there is no comprehensive, single listing of all paint manufacturing facilities, we relied on a number of data sources to estimate that there are 972 paint manufacturers. This estimate of 972 paint manufacturers in the universe was derived from the total number of paint manufacturing facilities of interest (187) found from the survey, by extrapolating through the percentages of SIC 2851 facilities in the Dun & Bradstreet database that are represented by the 187 facilities. For a more detailed analysis, see the listing background document in the public docket for this proposed rule.

To estimate the total waste generation by the entire population of U.S. paint manufacturers (or universe), weighted data from the survey (representing the quantities generated by the 566 paint manufacturing facilities in the sampling population, as described above) is extrapolated using a multiplier of 1.7173 (= 972 ÷ 566). For example, if the total quantities of a certain residual generated by the 566 paint manufacturing facilities in the sampling population were calculated as 16,115 tons, the universe waste quantities of this residual would become 16,115 tons × 1.7173 = 27,674 tons. We used such extrapolated universe waste quantities for our waste treatment and management capacity analysis (see Section VI.E) and economic impacts analysis (see Section IX.E). In general, these extrapolated figures appear consistent with data in the Biennial Report System (see the Economic Assessment in the docket for today's proposed rule).

f. *Meeting Our Objectives for The Survey.* We believe our statistical stratified random-sampling survey collected data are representative of the paint manufacturing industry in the United States, and that the responses provided sufficient data for our use in making this listing determination. We realize that uncertainties exist in our survey. There is uncertainty in the exact number of the U.S. paint manufacturing facilities. In addition, despite our quality assurance reviews, there could still be data source or sampling errors as in any other sampling or even census surveys. For instance, some facilities might have entered inaccurate information inadvertently. Nevertheless, we have used our best efforts to collect representative data. By employing a statistically representative stratification/categorization approach aimed at surveying all types of manufacturing facilities and their waste streams, our unequal sampling survey (higher percentages of facilities were surveyed for some categories of large and medium facilities) actually enhanced the chance of identifying the rare waste management activities practiced by the paint manufacturing industry and in turn increased survey precision. This approach is reasonable and an acceptable statistical tool to ensure the best possible coverage.

Our subsequent statistical re-analysis of the questionnaire returns indicated that we achieved satisfactory statistical probabilities for finding a waste management activity used by one in 20 facilities. The final probabilities achieved are discussed in the listing background document in the public docket for this proposed rule. In short, the probabilities achieved for two categories of paint manufacturing facilities, 85% and 86.2%, were under 90%, while the probabilities achieved for the other categories ranged from 91.7% to 100%. More importantly, the survey successfully captured a wide variety of intermediate and final waste management practices of most interest as discussed in Section III.D. Therefore, we believe we have made a reasonable effort to identify all management practices and that we have met the objective of our sampling survey designed for this listing determination.

III. Approach Used in This Proposed Listing

A. Summary of Today's Action

In listings promulgated by EPA, we typically describe the scope of the listing in terms of the waste material and the industry or process generating the waste. However, in today's rule we are proposing to use the recently developed ''concentration-based'' approach for listing paint manufacturing wastes. This approach was originally proposed for wastes generated by the Dyes and Pigments industry (64 FR 40192 of July 23, 1999). In a concentration-based listing, a waste would be hazardous unless a determination is made that it does not contain any of the constituents of concern at or above specified levels of concern. This approach draws from the concept of the toxicity characteristic to define a hazardous waste based on concentration levels of key constituents in the wastes. We describe this concept in detail later in this notice.

We are proposing two hazardous waste listings for paint manufacturing waste solids, K179 and for liquids, K180. If you generate paint manufacturing wastes from tank and equipment cleaning operations that use solvents, water, and/or caustic; emission control dusts; wastewater treatment sludges; or off-specification product, as specified in each listing description, you would need to determine whether your waste contains any of the constituents of concern identified for each listing at a concentration equal to or greater than the hazardous concentration level set for that constituent. However, the liquid K180 is a contingent listing. If your waste liquids are managed exclusively in tanks or containers prior to discharge to a POTW or under an NPDES permit, your waste would not be subject to the listing, and you would not need to make a hazardous waste determination for those wastes. We believe that under this proposed contingent listing approach, the vast majority of waste liquids would not pose unacceptable risks and would not be subject to the listing. The approach is discussed in detail in Section IV. The proposed listing descriptions are as follows:

- K179—Paint manufacturing waste solids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph (b)(6)(iii) of this section at a concentration equal to or greater than the hazardous level set for that constituent in paragraph (b)(6)(iii) of this section. Paint manufacturing waste solids are: (1) Waste solids generated from tank and equipment cleaning operations that use solvents, water and/or caustic; (2) emission control dusts or sludges; (3) wastewater treatment sludges; and (4) off-specification product. Waste solids derived from the management of K180 by paint manufacturers would also be subject to this listing. Waste liquids derived from the management of K179 by paint manufacturers are not covered by this listing, but such liquids are subject to the K180 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph (b) of this section.
- K180—Paint manufacturing waste liquids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph (b)(6)(iii) of this section at a concentration equal to or greater than the hazardous level set for that constituent in paragraph (b)(6)(iii) of this section unless the wastes are stored or treated exclusively in tanks or containers prior to discharge to a POTW or under a NPDES permit. Paint manufacturing liquids are generated from tank and equipment cleaning operations that use solvents, water, and/or caustic. Waste liquids derived from the management of K179 by paint manufacturers would also be subject to this listing. Waste solids derived from the management of K180 by paint manufacturers are not covered by this listing, but such solids are subject to the K179 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph (b) of this section.

Due to the uncertainties in our assessment of the management of paint manufacturing waste liquids in surface impoundments, we are seriously considering an alternative proposal not to list paint manufacturing waste liquids. We describe this alternative and our reasoning for this option later in this notice (see Section IV.D). The following discussion describes the approach we are proposing if K180 is listed.

If you generate any of these paint manufacturing wastes that you currently believe are characteristically hazardous or subject to another hazardous waste listing, you would still need to determine whether your waste is a listed hazardous waste under K179 or K180 (unless as noted above you are not subject to K180 because your wastes are managed exclusively in tanks or containers and then discharged to a POTW or under an NPDES permit). We are proposing that all generators could use knowledge of the waste to make an initial determination as to whether any of the regulated constituents are present in the waste. If you determine that none of the constituents are present in your wastes at the point of generation, then you would have no further obligation for determining whether or not your wastes are K179 or K180 listed hazardous wastes (assuming the regulated constituents are in fact not present in your wastes). If you determine that any of the constituents are present in your waste, then we are proposing that you must either use a two-tiered approach (see Section V.C for description) to determine whether the constituent concentrations in your waste are below the concentration levels in the listing or assume that your wastes are hazardous at the point of generation. Under the proposed two-tiered approach, if your total projected annual generation of paint manufacturing waste solids is over 40 metric tons, and/or over 100 metric tons of paint manufacturing waste liquids, you would need to test your wastes annually to determine whether concentration levels are below the listing concentrations. If your wastes remained nonhazardous for three consecutive years of testing and you have no significant changes to your product and/or manufacturing or treatment processes, the annual testing requirement would be suspended. If you made significant changes to product and/or manufacturing or treatment processes, the annual testing requirements would be reinstated. If your projected annual waste generation is below these volumes, you would have the option of either using knowledge of the waste or testing to determine whether constituent concentrations are below the listing concentrations. If any constituent is present at or above the concentration level, then your waste is hazardous waste. We are proposing that generators with annual waste generation exceeding 40 metric tons of solids and/or 100 metric tons of liquids keep limited records on-site.

If your wastes meet the listing description, they would be subject to all applicable RCRA subtitle C hazardous waste requirements, including LDR requirements. This means that any characteristically hazardous wastes or wastes hazardous under other listing codes (for example F codes) that are determined to be hazardous under these listings would also be subject to treatment requirements for K179 and K180, in addition to any other applicable treatment requirements.

There are several differences in the way the ''derived from'' rule (40 CFR 261.3(c)(2)(i) would be applied to these wastes that have one or more constituents above the proposed risk-based levels. Residues from the treatment of solid K179 wastes are no long hazardous wastes if their constituent concentrations are below the concentration levels for K179. However, these treatment residues would still be subject to all LDR requirements. As explained in Section IV, liquid K180 wastes, however remain subject to the derived from rule. Also, the listing descriptions make it clear that if a liquid is generated from the onsite management of the solid K179 waste, it is no longer subject to the K179 listing, rather it is subject to the K180 listing. If a solid is generated from the onsite management of the liquid K180 waste, it is no longer subject to the K180 listing, rather, it is subject to the K179 listing. Once K179 or K180 wastes are sent offsite waste codes do not change. These provisions are discussed in Section IV.F.

B. What Is a Concentration-Based Listing?

A concentration-based listing specifies constituent-specific levels in a waste that cause the waste to become a listed hazardous waste. In this proposed rule, we identify constituents of concern likely to be present in solvent, water, and/or caustic cleaning residuals; wastewater treatment sludges; emission control dust or sludges; and off-specification products and which may pose a risk above specified concentration levels. Using risk assessment tools developed to support our hazardous waste identification program, we assessed the potential risks associated with the constituents of concern in plausible waste management scenarios. From this analysis, we developed ''listing concentrations'' for each of the constituents of concern in the waste categories listed above.

If you generate any paint manufacturing waste liquids or solids addressed by this proposed rule, including any listed or characteristically hazardous wastes, you would be required either to determine whether or not your waste is hazardous or assume that it is hazardous as generated under today's proposed K179 and K180 listings. We are proposing that you must make a determination whether your waste is a listed hazardous waste through process knowledge or by determining representative concentrations for the constituents of concern in your waste through sampling and analyses (depending on the volumes of hazardous waste and nonhazardous waste within the scope of this listing that you generate each year). You can use process knowledge to demonstrate that the constituents of concern are not present in your waste. Your waste would be a listed hazardous waste if it contains any of the constituents of concern at a concentration equal to or greater than the hazardous concentration identified for that constituent. The detailed descriptions of the steps you would be required to follow to implement the concentration-based listing are described later in this proposed rule.

C. Why Is a Concentration-Based Approach Being Used for This Listing?

Thousands of constituents, also referred to as paint raw materials or ingredients, are used in paint formulations.[9] At the same time, there are a number of chemicals that are very widely used in many different types of paints. Because paints are produced in batch processes that generally do not involve chemical reactions among the raw materials, the finished paint and wastes consist of a mixture of the different raw materials. Paint production wastes can also contain constituents used for tank cleaning and other maintenance operations. As a result, it is straightforward for a manufacturer to know what constituents are likely to be present in his wastes.

Taking these facts into account, a concentration-based approach to listing paint production wastes as hazardous has a number of advantages. We can use the approach to focus more narrowly on ingredients that are likely to be widely used in paint formulations and that are likely to pose risks to human health and the environment. A concentration-based approach allows generators to evaluate the variable wastes they generate individually for hazard, so only the truly hazardous wastes are listed. This can place less burden on paint manufacturers than a traditional listing that brings entire waste streams into the hazardous waste system, regardless of the characteristics of wastes generated by individual generators. The level of any burden reduction depends on the costs of testing and the amount and type of wastes generated by a given facility. This approach is protective because it relies on concentration levels specifically set to protect human health.

Finally, a concentration-based listing approach may provide an incentive for hazardous waste generating facilities to modify their manufacturing processes or treat their wastes. For example, if a manufacturer has a listed hazardous waste based on constituent-specific concentration levels established by EPA, he also knows that if the concentration levels are reduced below the regulatory level due to raw material substitution or process change, the waste would not be regulated as listed hazardous waste. Therefore, the generator may decide to substitute raw materials in order to generate a nonhazardous waste (assuming that the waste does not carry any other listed or characteristic hazardous waste codes). This approach encourages waste minimization and reduced use of toxic constituents, goals of both RCRA and the Pollution Prevention Act of 1990 (42 U.S.C. 13101 *et seq.*, Pub. L. 101–508, November 5, 1990).

RCRA, section 1003 states that one goal of the statute is to promote protection of human health and the environment and to conserve valuable material and energy resources by ''minimizing the generation of hazardous waste and the land disposal of hazardous waste by encouraging process substitution, materials recovery, properly conducted recycling, and reuse and treatment.'' Section 1003 further provides that it is a national policy of the United States that, whenever feasible the generation of hazardous waste is to be reduced or eliminated as expeditiously as possible.

The Pollution Prevention Act of 1990 provides a hierarchy of approaches. Pollution should be prevented or reduced; pollution that cannot be prevented should be recycled or reused in an environmentally safe manner; pollution that cannot be prevented/reduced or recycled should be treated; and disposal or release into the environment should be chosen only as a last resort. If EPA provides a concentration-based target in the listing, generators would have the regulatory and economic incentive to meet the reduced levels.

Alternatively, we could have attempted to collect more information on these specific wastes to support the traditional listing approach, i.e., without any concentration limits. However, such a data collection effort would have been difficult due to the large number of paint production facilities, coupled with the wide variety of individual paint products and the potential variability in waste characteristics. Considering the

[9] *Paint and Coating Raw Materials,* 1996. Michael and Irene Ash, Synapse Information resources, Gower Publishing Ltd, lists more than 11,000 trade names and generic raw materials from 1300 manufacturers that are available for use in paints.

extensive sampling effort that this would require, and the relatively small quantities of wastes produced by individual paint facilities, we do not feel that such an effort was justified.

D. How Did the Agency Use the Survey Results for This Proposed Listing Determination?

We used the 3007 survey data for several purposes: (1) To provide the information for a general assessment of the paint and coating industry's waste generation and management practices; (2) to identify plausible waste management scenarios that are the basis for our risk assessment and listing determination; and (3) to serve as the data input for risk modeling parameters such as waste types and amounts sent to specific management practices.

This section primarily addresses the survey results as a basis for choosing plausible management scenarios for risk assessment and listing determinations and for selecting data for input to our risk modeling parameters. In addition, we used the survey data for our land disposal restrictions treatment capacity analysis and for our economic impact analysis discussed in sections VI and IX.

1. General Assessment of the Paint Industry's Waste Generation and Management Practices

Our first step was to characterize the U.S. paint and coating industry's generation and management practices. We considered a series of questions, such as: how much waste was generated in 1998; of that total, how much was RCRA hazardous waste and nonhazardous waste; what types of waste were generated; and how were these wastes managed? Table III.D–1 captures the weighted quantities of wastes within the scope of this listing reported by facilities completing the 3007 survey. See Section II.H for a discussion of the weighting process. With respect to total amounts of waste generated our analysis showed the following:

- We extrapolated from our estimated 566 paint and coating manufacturers in the sampling population of 884 to estimate that there are 972 paint and coating manufacturers, as explained in Section II, H(e). Out of these 972, we estimate that about 600 facilities annually generate about 107,000 metric tons of hazardous and nonhazardous waste within the scope of this listing.[10]
- About 36 percent of paint manufacturing wastes are already RCRA hazardous wastes, while 64 percent are currently nonhazardous.
- A few paint manufacturers produce the majority of the waste. Ten percent of manufacturers generating waste potentially within the scope of this listing generate about 80 percent of the total amount of waste; and two percent of the manufacturers generate about 50 percent of the total waste. Approximately half of paint manufacturers generate less than five metric tons of waste per year.
- Paint manufacturers mainly generate five types of nonhazardous waste liquids and waste solids: washwater cleaning liquid, washwater cleaning sludge, wastewater treatment sludge, emission control dust and off-specification product. As shown in Table III.D–2, these five waste types account for over 99% of all nonhazardous waste generated in 1998.
- About 27 percent of the manufacturers do not generate any waste—all their waste liquids and waste solids are recycled back into paint production processes.

After a thorough review of the data and other general observations about the paint industry generation and management practices, we focused further analyses only on nonhazardous wastes. We believe that this approach is appropriate because hazardous paint manufacturing wastes are currently managed according to RCRA Subtitle C regulatory controls. From our survey of the industry, we found that about 36% of the paint manufacturing wastes were coded and managed as listed or characteristically hazardous waste. The listed wastes typically carried a code for solvent wastes (F001 through F005), and characteristic wastes usually exhibited the characteristic of ignitability or toxicity. Based on available data from the survey, we believe that listed or characteristically hazardous waste are being properly managed under RCRA. The data supplied voluntarily by survey respondents that we have on constituent concentrations in wastes classified as nonhazardous show that the concentrations of TC constituents are well below the TC levels. By narrowing the scope of our analysis to include only nonhazardous wastes, we were able to concentrate risk assessment and subsequent listing decisions on the wastes that may not already be managed in a way that adequately protects or minimizes threats to human health and the environment. However, this proposed listing would apply to any paint manufacturing waste generated by the paint manufacturers from tank and equipment cleaning operations that use solvents, water and/or caustic; emission control dust; waste treatment sludges and off-specification production waste regardless of how the waste has been or is currently being managed.

TABLE III.D–1.—PAINT MANUFACTURING WASTES GENERATED IN 1998

Weighted waste quantities (metric tons)	Paint manufacturing waste category					
	Solvent cleaning waste	Water and/or caustic cleaning waste	Wastewater treatment sludge	Emission control dust/sludges	Off-specification product	Total
Hazardous	18507	1047	0	39	3029	22622
Nonhazardous	39	34098	1490	1972	1948	39547
Hazardous and Nonhazardous	18546	35145	1490	2011	4977	62169

[10] Note that we used weighted waste quantities in our risk assessments (explained in Section II.H(e)), because the weighted quantities are directly derived from our survey data and we are more certain these waste quantities represent the true distribution of the sampled population.

TABLE III.D–2.—NONHAZARDOUS PAINT MANUFACTURING WASTE LIQUIDS AND SOLIDS GENERATED IN 1998

	Weighted waste quantity (metric tons)
Nonhazardous Waste Liquids:	
Solvent Cleaning Liquid	4
Washwater Cleaning Liquid	31,036
Caustic Cleaning Liquid	66
Total Nonhazardous Liquids	31,106
Nonhazardous Waste Solids:	
Solvent Cleaning Sludge	35
Washwater Cleaning Sludge	2990
Caustic Cleaning Sludge	6
Wastewater Treatment Sludge	1490
Emission Control Dust	1972
Emission Control Sludge	0
Off-Specification Product	1948
Total Nonhazardous Waste Solids	8441

2. Management Scenarios Currently Used at Paint Facilities and Our Selection of Waste Management Scenarios for Risk Assessment Modeling

This section summarizes our findings and conclusions concerning current paint manufacturing practices for nonhazardous waste management; the plausible waste management scenarios that we chose to model for the risk assessment; and why we did not model certain management practices. We also explain how we selected survey data from waste types and quantities going to specific management practices for risk modeling parameters. This entire section presents weighted survey data (See Section II.H(e)), unless otherwise noted. We believe that the weighted data that is derived from the responses of the estimated 566 paint manufacturing facilities most closely represents the distribution of actual paint facility waste quantities managed at individual waste management units at the 884 facilities in the sampling population, which we assume are representative of the universe of affected paint manufacturers. Table III.D–2 summarizes non-hazardous waste liquids and solids generation.

We chose to model four waste management scenarios based upon our review of the current waste handling practices reported in the survey and the plausibility that these scenarios represent actual practices that are used or could be used by the paint industry for disposal of paint manufacturing wastes. The scenarios that we chose are waste solids disposed in industrial nonhazardous waste landfills; waste liquids stored and treated in off-site tanks at centralized wastewater treatment facilities (CWTs) prior to discharge to a POTW or under a NPDES permit; waste liquids disposed in surface impoundments at CWTs; and, waste liquids stored and treated in tanks on-site at paint manufacturing facilities prior to discharge to a POTW or under a NPDES permit. The general criteria for selection of plausible waste management scenarios and the rationale for choosing each of these four scenarios is described in this section.

a. *Plausible Waste Management Selection Criteria and Modeling Considerations.* Our regulations at § 261.11(a)(3)(vii) require us to consider the risk associated with ‘‘the plausible types of improper management to which the waste could be subjected’’ because exposures to wastes (and therefore the risks involved) will vary by waste management practice. The choice of which ‘‘plausible management scenario’’ (or scenarios) to use in a listing determination depends on a combination of factors which are discussed in general terms in our policy statement on hazardous waste listing determinations contained in the proposed Dyes and Pigments Listing Determination (59 FR 66072, December 22, 1994). We have applied this policy in several previous listings and, with some specific modifications that reflect unique characteristics of the paint industry, believe it is appropriate to apply it here.

Our approach to selecting waste management scenarios to model for risk analysis is to examine current industry management practices; assess whether or not other practices are available to the industry; and to decide what the industry would reasonably be expected to use. There are common waste management practices, such as landfilling, which we generally presume may be plausible for solid wastes and which we will evaluate for potential risk. There are other practices which are less common, such as land treatment, where we consider them plausible only where the disposal methods have been reported to be practiced. Where a practice is actually reported in use, that practice is generally considered ‘‘plausible’’ and may be considered for potential risk. In some situations, potential trends in waste management for a specific industry suggest we will need to project ‘‘plausible’’ management even if it is not currently in use in order to be protective of potential changes in management and therefore in potential risk. We then evaluate which of these current or projected management practices for each waste stream are likely to pose significant risk based on an assessment of exposure pathways of concern associated with those practices.

To model plausible waste management practices in the paint industry, we used the individual waste quantities going from the surveyed facilities to a particular type of management unit. This data was used in a national risk modeling analysis to capture the range of waste quantities from all facilities in the sampling population sent to a particular type of waste management unit (the weighted waste quantity distribution). Each waste quantity in the weighted distribution has a weighting factor that represents the number of facilities in the total sampling population that send a particular waste to a particular waste management unit. We do not analyze the total quantity of wastes (i.e., the total universe waste generation data) going into a single waste management unit because this scenario never occurs. As discussed later in this section, when we found evidence that multiple waste streams from a single facility or wastes from more than one facility are sent to the same management unit, we added those quantities to ensure that we accurately reflect the individual and combined quantities of paint manufacturing wastes that are sent to a single management unit. (Section III.D.2(c), below explains the methodology we used to compile the survey data for input to the risk assessment models.)

EPA estimates that in 1998, the 884 facilities in the sampling population generated 8,441 metric tons of nonhazardous waste solids and 31,106 metric tons of nonhazardous waste liquids. As would be expected, wastes generated from paint production batches are also generated in batches rather than in a continuous stream. Generally, the waste quantities associated with each batch are relatively small, so that these smaller quantities are aggregated and added into containers or tanks as each new batch is produced. Liquid wastes are added into liquid wastes and solid wastes are added into solid wastes, so that a variety of waste types (for example sludges from tank cleaning operations and wastewater treatment) may be combined and sent off to one waste management unit. At the same time, some waste types are managed separately, if for example they have some value for fuel blending, rather than simply being sent off to land disposal or wastewater treatment and discharge. We were able to distinguish these management practices from the survey data.

One final note, before looking at solid and liquid wastes separately. The total waste quantities that are accounted for in all of the management practices that we discuss are not equivalent to the total waste generation quantities. We believe there are several reasons for this. First, because of the way the survey was structured, we were not able to obtain an absolute balanced accounting of waste generation and waste management from each facility. Some of the discrepancy reflects waste management situations that may span one year to the next, e.g., when a facility accumulates waste over a longer time period before sending it on to disposal. Second, some wastes (or residuals) may be accumulated for a time, and then recycled back into the manufacturing process instead of being disposed. Third, there may be some undetected reporting errors in the database. In any event, the discrepancy between waste quantities generated in 1998 and waste quantities disposed in 1998 is not significant for risk assessment purposes. In the risk assessment, we use a distribution of individual waste quantities actually sent to management scenarios as input to the model, not national total waste quantities. The distribution of individual waste quantities would not be significantly affected by the discrepancy between wastes volumes generated and waste volumes disposed.

Before we proceed to the technical discussion of our rationale for choosing certain modeling scenarios and parameters, we will briefly explain why we chose to structure these discussions as they are presented in this preamble. We estimate that the 884 facilities in the sampling population disposed of 44,278 metric tons of nonhazardous waste solids and waste liquids in 1998 as shown in Tables III.D–3 and III.D–4. These tables show that the disposal destinations, as would be expected, are different for the waste solids and the waste liquids. The same four waste solids that comprised the majority of the nonhazardous waste solids generated in 1998 have very similar waste management patterns. In contrast, the largest quantity of waste liquid generated in 1998, washwater cleaning liquid is managed differently from the solids and almost entirely through discharge to off-site public and private wastewater treatment facilities. For these reasons, we split our analysis of the waste solids and waste liquids. It was clear that risk modeling for these two types of wastes would differ, therefore it seemed reasonable to analyze the waste management patterns for them separately.

b. *Selection of Waste Management Scenarios for Risk Assessment Modeling of Nonhazardous Paint Manufacturing Waste Solids.* Table III.D–3 lists the estimated weighted quantities of each type of nonhazardous waste solid going to each management practice for the 884 facilities in the sampling population. The total amount of waste solids disposed in 1998 was 8,226 metric tons (weighted). Of these 8,226 metric tons, 8,152 metric tons is made of the same four waste solids that comprised the majority of solid waste generated in 1998: off-specification product, emission control dust, washwater cleaning sludge and wastewater treatment sludge. We estimate that the major portion of these four solid waste streams, 6,926 metric tons, is disposed in Subtitle D municipal and industrial landfills (nonhazardous landfills). These 6,926 metric tons includes 942 metric tons of off-specification product, 1,947 metric tons of the emission control dust, 1,440 metric tons of wastewater treatment sludge and 2,597 metric tons of washwater cleaning sludge disposed in 1998. In addition, 35 metric tons of solvent sludge goes to nonhazardous landfills. The remaining 1,300 metric tons of waste solids disposed in 1998 go to Subtitle C landfills, fuel blenders, CWTs, waste piles, incinerators, cement kilns, boilers and industrial furnaces and "other" management units. Note that tanks and containers are intermediate storage and treatment units and their waste quantities are not counted in the total 8226 metric tons disposed in 1998.

TABLE III.D–3.—NONHAZARDOUS WASTE SOLIDS MANAGEMENT

Waste mgt. units	Waste solids types (weighted quantities in metric tons)						
	Off-spec. product	Emission control dust	Emission control sludge	Wastewater treatment sludge	Washwater cleaning sludge	Caustic cleaning sludge	Solvent cleaning sludge
Subtitle D/MLF	**942**	**1947**	0	**1440**	**2597**	0	**35**
Subtitle C	**80**	**9**	0	0	**352**	0	0
On-site S. tank	53	0	0	0	1814	0	0
Off-site S. tank	0	0	0	0	0	0	0
On-site Trt. tank	0	1066	0	487	0	0	0
Fuel Blending	**352**	0	0	**21**	**4**	0	0
POTW	0	0	0	0	0	0	0
WWTF	**48**	0	0	**5**	0	0	0
NPDES	0	0	0	0	0	0	0
INC	**72**	**5**	0	**24**	**50**	**6**	0
Cement Kiln	**56**	0	0	0	0	0	0
BIF	**3**	0	0	0	0	0	0
Container	2023	3052	0	992	1154	6	2
Waste Pile	0	0	0	0	0	0	**33**
Other	**133**	**11**	0	0	**1**	0	0
Totals**	**1686**	**1972**	0	**1490**	**3004**	**6**	**68**

**Total of each waste solid disposed in 1998 includes all disposal types except tanks and containers. The tanks and containers are considered intermediate handling, not final disposal destination steps.

Note: The bolded numbers within the table are those that were used to derive the totals for each column.

MLF=Municipal Landfill

On-site S. tank=On-site Storage tank

Off-site S. tank=Off-site Storage tank

On-site Trt. Tank=On-site Treatment tank

NPDES=National Pollutant Discharge Elimination System

INC=incinerator

BIF=Boiler & Industrial Furnace
POTW=Publicly Owned Treatment Works
WWTF=Wastewater Treatment Facility

Based on this information, we chose to model disposal of waste solids in industrial nonhazardous landfills. This is a common disposal practice for a large portion of the waste solids disposed in 1998. There are only two differences in modeling assumptions for industrial nonhazardous landfills as compared to municipal landfills. Industrial nonhazardous landfills are slightly smaller than municipal landfills so the quantities of paint manufacturing waste modeled in the industrial landfill are a relatively larger proportion of the total waste quantities going into the unit. Also, industrial nonhazardous landfills are not assumed to have daily cover. Both of these add to the conservatism of the protective constituent levels predicted by the risk assessment. For our inputs to the risk modeling, we used quantities of off-specification product, emission control dust, wastewater treatment sludge, washwater cleaning sludge and solvent sludge sent to nonhazardous landfills. We did not include the small volume of caustic cleaning sludge because they were incinerated and they were not disposed in nonhazardous landfills. Emission control sludge was not included either because it was not generated by any of the survey respondents in 1998. The risk assessment in Section III.E, contains more details about the methodology of the risk modeling process.

At the outset of our analysis of the survey data, we did not believe that a landfill was a logical disposal destination for off-specification product. We further investigated the disposal information for off-specification product and decided that it should be in our waste solids quantity distribution for risk assessment. We contacted the eleven facilities that reported generating off-specification paint. Nine of the eleven facilities stated that they sent only dried paint wastes to nonhazardous landfills. The tenth facility reported sending 7.5 metric tons of mostly dried paint and paint flakes with small amounts of liquid paint wastes to landfills. The eleventh facility reported sending 14.7 metric tons of off-specification product of unknown physical characteristics to nonhazardous landfills in 1998. We chose to model off-specification product with waste solids sent to nonhazardous landfills because large quantities (920 out of 942 metric tons) of this waste are in dry form when sent to nonhazardous landfills. Also, Municipal Solid Waste landfills have a prohibition on disposal of liquids and we believe that the majority of commercial industrial landfills do also (according to a 1995 EPA report ''State Requirements for Industrial Non-Hazardous Waste Management Facilities,'' 28 states restrict the placement of liquids in industrial nonhazardous waste landfills).

The survey data contained information about four types of waste management practices for waste solids that we chose not to model. The first of these is treatment of solvent sludge in a waste pile. One facility reported using a waste pile as an intermediate waste management step for 33 metric tons of solvent sludge. Based on further discussion with the facility contact, we determined that this waste was a free flowing slurry that was piled on cardboard boxes inside a containment building to dry and then disposed in a nonhazardous landfill. We chose not to model this scenario because the waste is managed in a closed facility. It is not open to airborne wind transport and does not involve placement directly on the land. The remaining solidified waste is disposed in a nonhazardous landfill.

Another type of waste management that we did not model is combustion in incinerators, cement kilns, and boilers and industrial furnaces. In past listing determinations where we have attempted to assess risks from incineration, we found that the potential risks from the release of constituents through incineration would be at least several orders of magnitude below potential air risks from releases from tanks or impoundments (see listing determination for solvent wastes at 63 FR 64371, November 19, 1998). Further, it is difficult to model what goes into combustion units in relation to the residual constituents that are released from the combustion unit either in ash or air.[11]

We also chose not to model solid wastes sent to fuel blenders. All of the fuel blending facilities reported in the survey were located at Subtitle C permitted facilities. Since these fuel blenders receiving paint manufacturing waste solids are RCRA permitted, they must comply with protective regulations regarding releases from RCRA units and from the RCRA facility. Finally, for these units it is also difficult to model what goes into the unit in relation to the residual constituents that are released from the unit to the air.

One last category of management unit that we chose not to model is the ''other'' category. For the waste solids reported in this survey, ''other'' encompassed a variety of waste management types. The total 145 metric tons of waste solids handled in ''other'' management units can be divided into four categories: Wastes that are disposed off-site at waste treatment facilities, wastes that are reworked back into the paint process, wastes that are sold to other companies and wastes sent for precious metal recovery. Sixty-nine (69) metric tons of off-specification product and emission control dust were sent to off-site waste treatment and disposal facilities. Nine metric tons were treated on-site and then sent to a Subtitle C landfill. Fifty-nine (59) metric tons of off-specification product and emission control dust were reworked back into the paint process on-site. Small quantities of off-specification product and emission control dust totaling 3.5 metric tons were sold to other companies who were not concerned about the quality of the paint manufacturing waste for the manufacture of a new product or the resale of a low grade paint. Less than one metric ton (0.7) of emission control dust was sent to an off-site precious metal recovery facility for recovery of the silver in the paint manufacturing waste. Three metric tons of waste solids out of the 145 metric tons is emission control dust that was reported to be released to the air from pollution control devices that were not functional. The remaining one metric ton of washwater cleaning sludge was sent to an off-site waste treatment facility. We chose not to model any of these scenarios because the scenarios we did decide to evaluate were likely to be the riskier scenarios and over half of these wastes going to ''other'' units were either being reworked into the paint process or used for manufacture of other products.

The paint manufacturing industry recycles several of its waste streams. One of these streams is air emissions control dust. Sometimes this material is used on-site in the formulation of low-grade paint, or sent off-site to other

[11] While other products of incomplete combustion may present possible risks, it is difficult for us to assess this potential for the chemicals of concern, especially for the likely scenario of a small volume of paint manufacturing wastes being treated with other much larger volumes of organic wastes.

paint manufacturers for the same purpose (in neither case is reclamation involved). In either case, the dust would not be considered a solid waste because it is used or reused as an ingredient in an industrial process to make a product pursuant to 40 CFR 261.2(e)(I)). The dust contains valuable raw materials that are required to make paint products. We have therefore not included these recycled dusts when modeling our waste disposal scenarios. The Agency also notes that this practice appears to be a form of legitimate recycling because paint (even low-grade paint) must always meet certain specifications to be usable. Recycled dust would only be added if it served as a required ingredient in the paint.

Another method of recycling air pollution control dust involves sending the materials off-site for recovery of precious metals (e.g., gold, silver, platinum). These materials would be considered solid and hazardous wastes if they exhibit the toxicity characteristic for metals, or if they exceeded the concentration levels in today's proposed listing. Under those circumstances, they would be subject to the reduced regulatory requirements of 40 CFR 266.70. However, EPA has chosen not to include these materials in our waste disposal scenarios because we believe that their inherent economic value would ensure careful handling, thereby greatly minimizing the risk of releases. See the 1985 rationale for the special regulatory regime for precious metal reclamation (50 FR614, 648–49 (January 4, 1985)).

c. *Selection of Waste Management Scenarios for Risk Assessment Modeling of Nonhazardous Paint Manufacturing Waste Liquids.* EPA estimates that the 884 paint manufacturing facilities in the sampling population disposed of 36,052 metric tons (weighted) of waste liquids in 1998. Over 99% of this amount is washwater cleaning waste. A very small amount of solvent cleaning and caustic cleaning liquids make up the remaining 69 metric tons. Table III.D–4 shows how the 36,052 metric tons of nonhazardous waste liquids were disposed in 1998.

The predominant destinations for washwater cleaning liquids are POTWs and CWTs. About 27,625 metric tons of washwater cleaning liquid go to POTWs and 6407 metric tons go to CWTs. Some of the 27,625 metric tons of washwater cleaning liquid is directly discharged to POTWs, but a significant portion is stored and treated on-site prior to being sent to the POTW. Fourteen thousand five hundred thirty (14,530) metric tons of washwater cleaning liquids are managed in on-site storage tanks and 7487 metric tons of washwater cleaning liquids are managed in on-site treatment tanks. These tanks are the intermediate storage and treatment units for almost all of the washwater cleaning liquids going to POTWs, CWTs and the remaining waste management categories where these liquids are disposed. The survey results indicated that about 17,000 metric tons of washwater cleaning liquids are directly discharged by paint facilities to POTWs. The remainder of the washwater cleaning liquids (10,000 metric tons) that are sent to POTWs are stored or treated in on-site tanks prior to discharge to the POTW. One facility directly discharges 76 metric tons of washwater cleaning liquid under a NPDES permit. These NPDES and POTW point source discharges that are subject to regulation under Section 402 of the Clean Water Act are excluded from the RCRA statutory definition of solid waste and therefore are not subject to RCRA regulation. See 42 U.S.C. 6903(2) and 40 CFR 261.4(a)2. However, while the liquids are being collected, treated or stored they are subject to RCRA regulation. This also applies to any sludges derived from the storage or treatment of the liquids.

Another destination for washwater cleaning liquid is offsite storage and treatment tanks at CWTs. About 6407 metric tons of washwater is sent to CWTs for treatment and then discharged to POTWs or under a NPDES permit. The volumes of washwater liquid are probably stored and treated in offsite tanks as our survey data showed that they are onsite.

''Other'' management units receive 1309 metric tons of washwater cleaning liquids. Five hundred sixty-three (563) metric tons of washwater cleaning liquid goes to fuel blending units, incinerators and cement kilns. A very small amount of washwater cleaning liquid, 3 metric tons was sent to nonhazardous landfills in 1998.

The other two waste liquid streams, solvent cleaning and caustic cleaning liquid are disposed at fuel blending facilities and at POTWs, respectively. POTWs received about 32 metric tons of caustic cleaning liquids and fuel blenders received 4 metric tons of solvent cleaning liquid in 1998. Sixty-one (61) metric tons of caustic cleaning liquid is stored or treated in on-site tanks and an additional 33 metric tons is managed in ''other'' units.

Based on these facts, we chose several modeling scenarios. The first of these was the off-site storage of washwater cleaning liquids in uncovered tanks at CWTs. About 18% of the yearly total of washwater cleaning liquid disposed goes to CWTs. Another scenario we modeled was the onsite treatment of washwater in tanks prior to discharge to a POTW or under a NPDES permit. We also chose to model the on-site treatment of washwater cleaning liquids in tanks because a significant amount of liquids are handled in on-site tanks. This modeling scenario should account for any exposure to washwater cleaning liquids and sludges being treated in on-site tanks that are subsequently disposed through a POTW or NPDES discharge.

We also chose to model waste liquids managed in an unlined surface impoundment because we found one lined surface impoundment at a CWT and we cannot, at this time, rule out the possibility that some quantities of liquid paint manufacturing wastes may be managed in an unlined impoundment which would present greater risks of release to the environment. Survey respondents did not report any on-site impoundments for management of liquid wastes. However, because we know that waste management in surface impoundments, and particularly in unlined impoundments, could pose significant risk, we chose to look for other plausible scenarios that might involve impoundments.

TABLE III.D–4.—NONHAZARDOUS WASTE LIQUIDS MANAGEMENT

Waste mgt. units	Waste Liquid types (weighted quantities in metric tons)		
	Washwater cleaning liquid	Caustic cleaning liquid	Solvent cleaning liquid
Subtitle D/MLF	**3**	**0**	0
Subtitle C	0	0	0
On-site S. tank	14530	33	0

TABLE III.D–4.—NONHAZARDOUS WASTE LIQUIDS MANAGEMENT—Continued

Waste mgt. units	Waste Liquid types (weighted quantities in metric tons)		
	Washwater cleaning liquid	Caustic cleaning liquid	Solvent cleaning liquid
Off-site S. tank	1	0	0
On-site Trt. tank	7487	28	0
Fuel Blending	**455**	0	**4**
POTW	**27625**	**32**	0
WWTF	**6407**	0	0
NPDES	**76**	0	0
INC	**56**	0	0
Cement Kiln	**52**	0	0
BIF	0	0	0
Container	1517	0	4
Waste Pile	0	0	0
Other	**1309**	**33**	0
Totals**	**35983**	**65**	**4**

** Totals for each column are derived from addition of all the bolded numbers in each column. This total includes all disposal types except tanks and containers, these are considered intermediate handling, not final disposal destination steps.

Note: The bolded numbers within the table represent the quantities of disposed waste that were summed to calculate the total waste disposed for each waste type.

MLF=Municipal Landfill
On-site S. tank=On-site Storage tank
Off-site S. tank=Off-site Storage tank
On-site Trt. Tank=On-site Treatment tank
NPDES=National Pollution Discharge Elimination System
INC=incinerator
BIF= Boiler & Industrial Furnace
POTW=Publicly Owned Treatment Works
WWTF=Wastewater Treatment Facility

In other listing determinations, we have found management in surface impoundments for a number of waste streams, although on-site impoundments are more often associated with industries managing larger quantities of liquids. As discussed above, a number of facilities send their liquid waste to CWTs. These are the facilities that we believe could plausibly be managing wastes in surface impoundments. We contacted nine CWTs identified by survey respondents as receiving their wastes to determine whether any of them employ impoundments as part of their treatment processes. In fact, we found one facility that uses a double-lined impoundment.

Twenty-one survey respondents indicated that they are sending liquid waste to facilities they identified as wastewater treatment facilities. Considering the universe of estimated 972 paint manufacturers, we estimate that 4 or 5 other impoundments may be receiving paint manufacturing wastes (see the listing background document for this analysis). It may be reasonable to assume that management of paint manufacturing wastes in an unlined surface impoundment may occur. Therefore, we assumed this is a plausible management scenario that we modeled for our risk assessment. Section IV. D (proposed listing determination) contains additional discussion concerning uncertainties associated with this scenario and discussion of whether this is likely to be sufficiently rare that we should consider an alternative approach.

Finally, we chose to model management of washwaters in on-site, uncovered treatment tanks. Eight survey respondents reported that they had uncovered on-site storage and treatment tanks. Volatile emissions from the hazardous constituents contained in the washwater cleaning liquids could be released into the air from these uncovered tanks. Therefore we also chose to model management of waste liquids in uncovered on-site treatment tanks because treatment tanks represent a more conservative modeling scenario (higher air emissions from aerated tanks) than storage tanks. We modeled the scenario of waste liquids stored in uncovered storage tanks. We used the weighted quantities of waste liquids (22,078 metric tons) reported in the survey as being managed in on-site storage and treatment tanks.

There were five types of waste liquid management that we did not choose to model. One of these management scenarios is the disposal of washwater cleaning liquid in nonhazardous landfills. We contacted the facilities that reported this practice and found that, in both cases, the washwater cleaning liquid sent to the landfills was a liquid/solids mixture. One facility reported that the mixture was filter pressed at the landfill, the water portion was discharged to a POTW and the remaining sludges were dried and disposed in a nonhazardous landfill. The other facility reported that the liquid portion was incinerated and the solids placed into a nonhazardous landfill. These scenarios are not, therefore placement of liquids in a landfill. The next type of waste liquids management that we did not model is the direct discharge of washwater cleaning liquids to a POTW. RCRA regulation of waste liquids that are stored or treated in tanks prior to discharge to a POTW or under a NPDES permit is excluded under 40 CFR 261.4(a)(2), at the permitted discharge point for the facility. The on-site storage, collection and treatment of liquids and sludges generated from waste liquids are however, subject to RCRA regulation. Another management type that was not modeled is the combustion of washwater cleaning liquids and caustic cleaning liquids in incinerators and cement kilns or via fuel blending. In the previous section on waste solids we explain the Agency's rationale for not modeling combustion or fuel blending. That rationale applies equally to waste liquids.

The categories of ''other'' units reported for waste liquids that we considered but did not select for modeling are: 541 metric tons of washwater cleaning liquids reworked back into the paint process; 570 metric tons of washwater cleaning liquids treated on-site in tanks and discharged to POTW and NPDES point sources; 51 metric tons of washwater and caustic cleaning liquids stabilized on-site and sent to Subtitle C landfills and 179 metric tons of washwater cleaning liquids sent to on-site and off-site treatment units. The washwater cleaning liquids reworked back into the paint process may not be in the scope of this listing. However, our modeling of uncovered on-site treatment tanks does estimate the risks from any of these washwater liquids that are within the scope of the listing. The washwater cleaning liquids reported under ''other'' that are discharged to a POTW should have been reported as going to POTWs and included in that quantity of washwater cleaning liquids. As explained earlier, the on-site treatment or storage of any liquids being discharged to a POTW is covered by our risk modeling of on-site treatment tanks. The washwater and caustic cleaning liquids that are treated on-site and sent to a Subtitle C landfill are also covered by our on-site treatment tank modeling. The last group of ''other'' units (the 179 metric tons of waste liquids) consists of 23 metric tons of washwater cleaning liquid sent for off-site treatment and disposal; and 156 metric tons of on-site treatment conducted in tank type units. The estimate of any risks posed from the treatment of washwater cleaning liquids in these units should be covered by our risk modeling of on-site treatment in tanks of washwater cleaning liquids.

d. *Survey Data as Input to Modeling Parameters.* To conduct a risk assessment for these wastes, we needed to assemble the survey data associated with disposal of waste solids and waste liquids into our chosen waste management units of concern: industrial nonhazardous landfills, on-site tanks, off-site tanks and surface impoundments. The specific data we used were the quantities of waste solids and waste liquids sent by each facility to each of our four management units of concern. We used these data as input to the modeling parameters in our risk assessment. The risk assessment estimated the concentration of individual constituents that could be present in each waste and remain protective of human health and the environment. These risk based constituent concentration levels in the waste streams are the levels that can be managed in the waste streams and remain below a target cancer risk level of 1 X 10^{-5} excess lifetime cancer risk for individuals exposed to carcinogens in the waste streams and a target hazard quotient (HQ) of 1.0 for individuals exposed to constituents in the waste streams that produce noncancer health effects.

We also needed to capture the distribution of waste quantities going to individual waste management units. Once we determined that we could represent paint manufacturing wastes as solids and liquids disposed in nonhazardous landfills, on-site treatment tanks, off-site wastewater treatment tanks and surface impoundments, we then developed a methodology to assemble the waste quantity distributions for solids and liquids sent from each facility in the sampling population to each of these four types of waste management units. We used the individual weighted quantities of waste solids sent to nonhazardous landfills to compile the waste solids distribution and the individual weighted quantities of waste liquids sent to tanks and surface impoundments at offsite wastewater treatment facilities for the waste liquids distribution. We considered several factors in developing the waste quantity distributions including the total quantities of each individual type of waste stream reported by the surveyed facilities, whether any facilities that generate these wastes may produce quantities of waste conditionally exempted under EPA regulations for small quantity generators and whether any of the surveyed facilities reported waste co-management scenarios.

First, we identified conditionally exempt small quantity generators by combining the entire hazardous and nonhazardous paint manufacturing waste solid and liquid quantities for all waste streams within the scope of this listing generated by each surveyed facility. We compared these quantities of waste to the amount specified in § 261.5 (a), the Conditionally Exempt Small Quantity Generator (CESQG) exclusion criteria. This existing regulation excludes those facilities from Subtitle C that generate no more than 100 kilograms per month of hazardous waste or 1.2 metric tons per year. We separated the survey data from the CESQG facilities because under the Federal RCRA regulations, they could continue to send their small waste quantities to nonhazardous disposal facilities. Including these very small waste quantities in our risk modeling could inappropriately bias the modeling results toward the higher protective constituent concentrations. Therefore, it would be inappropriate to include these small volumes in the risk modeling to develop the regulatory limits, since these wastes would be excluded from the regulation. Also, including these small volumes in the modeling would bias the results towards higher protective limits because, all other things being equal, small volumes result in lower estimated risk and therefore higher protective levels. Further, even if all the CESQG facilities' wastes are hazardous, they could continue to manage them in a municipal solid waste landfill, in accordance with appropriate individual state requirements. Twelve facilities reported that they generated less than 1200 kilograms per year of hazardous and nonhazardous wastes combined. We did not use the data for these 12 for any of the risk assessment modeling because the generators of these conditionally exempt quantities could continue to manage their wastes as they are currently managing them even if the wastes were listed.

Next, we compiled separate waste quantity distributions for waste solids and waste liquids. We also accounted for co-management scenarios as reported in the survey responses. Co-management scenarios are: (1) Waste solids or waste liquids generated at a single paint facility that are disposed at the same off-site management unit, and (2) waste solids or waste liquids from different paint facilities that are sent to the same off-site waste management unit. Each of these combinations results in larger paint manufacturing waste quantities being associated with disposal at particular waste management units. We combined these quantities for 14 waste solid co-management scenarios.

At this point, the waste solids quantity distribution consisted of quantities of nonhazardous off specification product waste, nonhazardous emission control dust, nonhazardous water/caustic sludge, nonhazardous wastewater treatment sludge and nonhazardous solvent sludge sent to nonhazardous landfills. All waste solid quantities from any of the surveyed facilities that did not meet the conditionally exempt small quantity generator exclusion were included. The waste solids quantity distribution had 57 entries for single and co-managed waste streams. In addition to this quantity distribution that combined all the types of waste solids (combined waste solids), a second quantity distribution was constructed that contained only nonhazardous emission control dust sent to nonhazardous landfills. The emission control dust only distribution was constructed similarly to the manner in which the combined solids quantity distribution was constructed. It did not include the conditionally exempt small quantity generator facilities data and co-management of wastes was considered. The emission control dust only distribution was input into the risk model with an accompanying low moisture content to represent a worst-case scenario for wind blown materials that could be released from the nonhazardous landfill.

We created three separate waste liquid distributions in the same manner as the solids distributions to correspond to the modeling scenarios for liquids. Initially, any CESQG facilities that generated waste liquids were eliminated from consideration. The first waste liquid distribution contained washwater cleaning liquid quantities sent off-site to a CWT. We combined waste liquid quantities where we found co-management scenarios. We used this quantity distribution to evaluate washwater cleaning liquid stored in uncovered off-site tanks at CWTs. Next, the surface impoundment waste liquid quantity distribution was exactly the same as the distribution of all quantities of washwater cleaning liquids that sent to off-site CWTs. Because surface impoundments, when they exist, are a part of the CWT's treatment process, we assumed that quantities of waste liquids sent off-site to CWTs could be treated in unlined surface impoundments as well as in tanks. The third liquids quantity distribution consists of the largest washwater cleaning quantity reported in the survey. This single quantity was used to conduct a conservative risk assessment screening for exposure to emissions from waste liquids in uncovered on-site treatment tanks.

To summarize, we assembled five separate quantity distributions using the survey response information.

- One distribution consisted of all the survey quantities of nonhazardous combined waste solids from: nonhazardous solvent cleaning sludge, nonhazardous washwater cleaning sludge, nonhazardous waste water treatment sludge, nonhazardous emission control dust and nonhazardous off specification product. This distribution called, ‘‘combined solids’’ was used for risk analysis as a sludge-like material in a nonhazardous landfill.
- The second distribution consisted of all nonhazardous emission control dust quantities only. This distribution was used for risk assessment modeling as a dust-like material going to a landfill.
- The third distribution was a liquids distribution that consisted of all nonhazardous liquid quantities of nonhazardous washwater cleaning liquid that were disposed in off-site tanks at CWTs. This liquids distribution was used for risk modeling of waste liquids being sent to uncovered off-site treatment tanks.
- The fourth quantity distribution was exactly the same as the one above, but the target management unit was a surface impoundment instead of a tank.
- The last quantity used for modeling was a single quantity, the highest washwater cleaning liquid quantity managed in uncovered on-site treatment tanks as reported in the survey. This was used to evaluate risks from waste liquids managed in on-site storage and treatment tanks.

Each of these quantity distributions was used in the process of modeling the risk to human and environmental receptors from the disposal of waste solids and liquids in nonhazardous landfills, tanks and surface impoundments. The next section describes the risk assessment approach and process in detail.

E. What Risk Assessment Approach Did EPA Use to Determine Allowable Constituent Waste Concentrations?

1. Which Factors Did EPA Incorporate Into Its Quantitative Risk Assessment?

In making listing determinations, the Agency considers the listing criteria required in 40 CFR 261.11. The criteria provided in 40 CFR 261.11 include eleven factors for determining ‘‘substantial present or potential hazard to human health and the environment.’’ Nine of these factors, as described generally below, are directly incorporated into EPA's completion of a risk assessment for the waste streams of concern:

- Toxicity (§ 261.11(a)(3)(i)) is considered in developing the health benchmarks used in the risk assessment modeling.
- Constituent concentrations that pose a hazard to human health are determined in the risk assessment (§ 261.11(a)(3)(ii)).
- Waste volumes (§ 261.11(a) (3)(viii)) are used to define the initial conditions for the risk evaluation.
- Potential to migrate, persistence, degradation, and bioaccumulation of the hazardous constituents and any degradation products (sections 261(a)(3)(iii), 261.11(a)(3)(iv), 261.11(a)(3)(v), and 261.11(a)(3)(vi)) are all considered in the design of the fate and transport models used to determine the concentrations of the contaminants to which individuals are exposed.
- Finally, we consider two of the remaining factors, plausible mismanagement as discussed in the previous section and other regulatory actions as discussed in Section IV on the proposed listing determinations ((§§ 261.11(a)(3)(vii) and 261.11(a)(3)(x)) in establishing the waste management scenario(s) modeled in the risk assessment.

EPA conducted analyses of the risks posed by the waste streams evaluated for this listing to determine the concentrations of constituents that if found in paint production wastes would meet the criteria for listing set forth in 40 CFR 261.11(a)(3). This section discusses the human health risk analyses and ecological risk screening analyses EPA conducted to support our proposed listing determinations for paint and coatings production wastes. We consider the risk analyses in developing our listing decisions for each of the waste streams. The risk analyses we describe in this section are presented in detail in the Risk Assessment Technical Background Document for Paint and Coatings Listing Determination which is located in the docket for today's proposed rule.

2. How Did EPA Use Damage Case Information?

We also considered whether any damage cases exist that indicate impacts on human health or the environment from improper management of the wastes of concern, which is required under the listing regulations (§ 261.11(a)(3)(ix)). Damage incidents might be useful in not only establishing whether there was any impact on human health or the environment from improper management, but such incidents might also provide some information on plausible mismanagement practices, and on the potential of the waste constituents to migrate, persist, or degrade in the environment. We compiled damage incidents involving paint production wastes and paint constituents, including paints disposed of by non-paint manufacturing facilities. We found approximately 21 incidents that appear to involve the release of constituents from the management of paint product wastes either at the site of paint manufacture, or at off-site facilities. We also found damage incidents for the disposal of paint wastes by end-users, and numerous other possible incidents for which we did not have adequate information to determine the type of facility or the nature of the waste involved. A report summarizing the results of this search is in the docket for today's rule (Damage Incident Compendium and Report, July 2000).

A number of the data sources contained information on potential problems related to management or use of paint materials at a variety of sites. The information of most potential utility came from the Superfund Public Information System (SPIS). The SPIS contains data from the Record of Decision System (RODS), which document remediation actions as sites on the National Priority List (NPL), and the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS), which contains other information on potential and actual Superfund sites. Information from other sources proved to be less useful. For example, a search of the Right-to-Know network database (RTK) provided some matches for paint as a pollutant in the database of civil cases filed by the Department of Justice on behalf of EPA, however these included violations of RCRA permitting, storage, and reporting requirements, rather than disposal problems, or violations of the CAA or CWA. The Defense Technical Information Center database provided information on defense installations on the NPL and slated for closing, however these appear to be end users, not paint manufacturers.

EPA believes the damage cases have limited utility for determining current plausible mismanagement scenarios. The vast majority of damage cases (especially Superfund sites) were from sites that operated prior to implementation of the current RCRA regulations, and generally reflect management practices that no longer occur (such as an in ground solvent pit, buried crushed drums and dumping liquids in trenches). We believe these past damage incidents do not represent current waste management practices by the paint manufacturing industry. This is supported by the results from the 3007 Survey, which indicate that manufacturers are coding and managing many wastes as hazardous, especially some of those likely to have the greatest solvent content. For example, all facilities that reported solvent cleaning wastes reported them to be hazardous, except for one that was sent to fuel blending. Therefore, we expect that waste management practices have changed, since the promulgation of the RCRA regulations, including the addition of a number of organics to the Toxicity Characteristic in 1990 and the listings for certain waste solvents (F001 to F005) in 1980 (and as revised in 1985).

In most cases, the available damage incident data rarely indicated the composition of the paint or paint manufacturing waste, nor the source of the waste. Instead, the data depicted the material or waste in general terms, such as ''paint,'' ''paint manufacturing waste,'' or ''sludges.'' Thus, the databases did not categorize the damage incidents involving paint manufacturing wastes into the specific waste categories of interest (solvent cleaning wastes; water/caustic cleaning wastes; wastewater treatment sludge; emission control dust or sludge; and off-specification production wastes) nor allow us to determine concentrations above which paint manufacturing wastes could pose a hazard. Thus we are unable to directly attribute contamination observed from the mismanagement of paint manufacturing wastes to those the wastes that are specifically addressed by this proposed listing.

Even if historical problems could be traced to paint materials, they are not very useful in assessing the potential risks for paint production wastes as they are currently generated. The damage incidents may represent the potential for the migration, mobility, and persistence of constituents in paint manufacturing wastes. The damage cases do provide some anecdotal information in support of a conclusion that some paint manufacturing wastes may yield environmental contamination when managed in the ways that lead to the damage cases. However, because the wastes in the damage cases may include wastes now managed as hazardous, and because the cases may reflect management scenarios we do not believe are currently common or plausible, it is difficult to use them to reach conclusions as to which of the wastes under evaluation in today's proposal may pose significant risks. Certainly it is difficult to use damage cases to ascertain at what concentration the paint manufacturing wastes under evaluation may pose such risks. Thus, while the damage cases supports that some paint manufacturing wastes may sometimes pose risks, EPA is relying upon its quantitative risk assessment in formulating today's proposal.

3. Overview of The Risk Assessment

For a concentration-based listing, EPA is proposing to calculate the concentration levels, or ''listing levels'' in the waste at or above which a waste would be considered hazardous. Risk assessment is used to identify the concentrations of individual constituents that can be present in each waste stream and remain below a specified level of risk to both humans and the environment.

To establish these listing levels, the Agency (1) Selected constituents of potential concern in waste, (2) evaluated plausible waste management scenarios, (3) calculated exposure concentrations by modeling the release and transport of the constituents from the waste management unit to the point of exposure, and (4) calculated waste concentrations that are likely to pose unacceptable risk. In addition, the EPA conducted a screening level ecological risk assessment to ensure that the concentration limits were dually protective of human health and ecological life.

The following sections explain the selection of constituents that we evaluated in the risk assessment and present an overview of the analysis the Agency used to calculate risk-based listing levels for solvent cleaning waste, water and/or caustic cleaning waste, waste water treatment sludge, emission control dust and sludges, and off-specification product. You will find more details of how we selected the constituents of concern in the Listing Background Document. Details of the risk assessment are provided in the document in the docket entitled Risk Assessment Technical Background Document for the Paint and Coatings Listing Determination (hereafter called the Technical Background Document).

4. How EPA Chose Potential Constituents of Concern

Our overall goal in choosing potential constituents of concern was to identify commonly used, potentially hazardous constituents that could pose unacceptable risk if present in mismanaged paint manufacturing wastes. Waste sampling was not practical because we would have had to conduct extensive sampling to adequately represent thousands of variable products and constituents. As an alternative, we chose to rely on published information and environmental databases to select constituents of concern. We believe our review of the literature available on paint formulation and manufacturing combined with our search of specific databases provided representative information on widely used raw materials. In addition, we selected constituents for which we had access to toxicity and fate and transport data to conduct a risk assessment for each potential constituent of concern. We verified and supplemented these sources with information provided by paint manufacturers when the 3007 survey data was available.

We used the following three-phased approach to develop a list of potential constituents of concern. In the first phase, we developed a preliminary list of potentially hazardous constituents in paint formulations which we could readily evaluate for potential risks to human health, and for which we have test methods to detect their presence in waste. In the second phase, we narrowed the list to constituents for which we would conduct a risk assessment. In the third phase, we added a limited number of constituents to the risk assessment, as additional information became available.

a. *Phase 1: How Did EPA Develop a Preliminary List of Constituents?* We developed a preliminary list of constituents in three steps: first, out of the thousands of constituents that are used as ingredients in paints, we identified a subset of potentially hazardous constituents used in paint formulations; second, we identified those constituents for which we have adequate data to complete a risk assessment so that we could develop a protective concentration level for the listing, if appropriate; finally, we ensured that test methods were available so paint manufacturers would be able to identify the presence and concentration of constituents in their wastes, as necessary.

Initially, we relied on the ''Database of Published Paint Information'' (available in the docket), a computerized database that characterizes paint raw materials. In particular, we used the ''Raw Materials Module'' which contains information on the following types of ingredients that are used to make paints (we believe that these categories cover the vast majority of paint ingredients that could pose a concern):

Additives—Inorganic and organic metal-containing raw material additives such as driers (siccatives), catalysts, stabilizers.

Binders—Organic polymeric compounds used to adhere the pigment particles and other paint ingredients into a film on the surface being painted.

Biocides—Compounds used to kill microorganisms and larger organisms such as insects. Categories of biocides include insecticides, anti-fouling compounds (e.g., for use on ships), fungicides, algaicides, and mildewcides.

Pigments—Insoluble particulates used to give the paint film color as well as structured strength, as well as in some cases imparting corrosion resistance or other properties to paint film.

Solvents—Solvents used both in traditional ''oil'' based (solvent based) paints, as well as those solvents used in waterborne paints.

The constituents in the ''Raw Materials Module'' were identified from an extensive set of reference materials, including textbooks, monographs, articles and Material Safety Data Sheets listed in the ''Bibliography of Documents Module'' of the database. We believe this survey approach allowed us to identify constituents that are used in paint formulations based on a variety of sources. We also emphasized constituents we had reason to believe were more likely to pose a risk to human health and the environment. (For example, we used other governmental sources, such as a National Institute of Occupational Safety and Health (NIOSH) document characterizing hazardous worker exposures in paint manufacturing, as well as our experience in the RCRA program dealing with a variety of hazardous and potentially hazardous constituents.) In the fall of 1999, when we developed the preliminary list of constituents, the Raw Materials Module contained approximately 500 constituents.

In developing the preliminary list of constituents, we also considered other sources that might provide information on specific constituents associated with paint manufacturing facilities. For this, we turned to the Toxics Release Inventory (TRI) data base. Under the Emergency Planning and Community Right-to-Know Act (EPCRA), all paint manufacturing facilities with ten or more employees must report chemical releases if they manufacture, process, or otherwise use any EPCRA section 313 chemicals in quantities greater than the established thresholds. Facilities must report the quantities of both routine and accidental releases. Facilities are required to report quantities only for individual constituents. In the 1997 TRI, a total of 646 facilities in SIC code 2851 reported releasing 115 different constituents into the environment. From these 115 constituents, we identified approximately 60 additional constituents that were not already in the ''Raw Materials Database,'' but were associated with paint manufacturing facilities. While TRI reports of constituent releases cannot be tied directly to the five waste streams in the scope of this rule, TRI releases do tell us that the constituents are used by paint manufacturing facilities, released into the environment, and could potentially be found in the waste streams of concern.

We recognize that the TRI data do not correlate perfectly to the scope of facilities and wastes potentially covered by this listing. For example, the SIC category also includes some facilities that are not paint producers. Also, TRI tracks releases of specific constituents. However, the TRI data do not distinguish whether the releases are hazardous or non-hazardous wastes or whether the constituents are present in a larger matrix with other materials. While TRI does not contain sufficiently detailed information to associate releases directly with paint production, it does provide the best available information source on toxic constituent releases to waste management units and environmental media from facilities within the appropriate SIC code.

Our next critical step in identifying a preliminary list of constituents was to determine which constituents we could readily analyze for potential human health effects and which constituents could be readily tested in wastes. We looked for the following:

Health benchmarks: values used to quantify a chemical's possible toxicity and ability to induce a health effect. Benchmarks are also specific to routes of exposure (ingestion or inhalation) and duration of exposure.

Physical/chemical properties: information used to predict the behavior and movement of constituents in the environment essential to model environmental fate and transport.

Analytic methods: reliable methods available to test for the presence of constituents at concentrations of concern in order to implement a concentration based listing. We identified those constituents that have available SW–846 analytic methods.

We found that of the constituents in the Raw Materials Module and the constituents reported in the TRI, 114 had health benchmarks. We then searched for data on physical/chemical properties and SW–846 analytic methods for each constituent. We finally had a list of 66 constituents with test methods and sufficient data to conduct further analyses. We included the 66 constituents in the 3007 survey and asked respondents to identify which constituents occurred in each of their paint manufacturing waste streams. Table III.E–1 lists the 66 constituents.

TABLE III.E–1.—CANDIDATE CONSTITUENTS FOR RISK ASSESSMENT

Acetone
Acrylamide and acrylamide derived polymers
Acrylonitrile and acrylonitrile derived polymers
Allyl alcohol
Antimony and compounds
Barium and compounds
Benzene
Benzyl alcohol
Butyl benzyl phthlate
Cadmium and compounds
Chloroform
Chromium and compounds
Cobalt and compounds
Copper and compounds
Cyanide
Cyclohexane
Dibutyl phthlate
3-(3,4__Dichlorophenyl-1)1 dimethylurea
Diethyl phthlate
Di (2-ethylhexyl) phthlate
2,4 Dimethylphenol
1,4 Dioxane
Ethyl acetate
Ethylbenzene
Ethylene glycol
Formaldehyde and formaldehyde-derived polymers
Isophorone
Lead and compounds

TABLE III.E–1.—CANDIDATE CONSTITUENTS FOR RISK ASSESSMENT—Continued

M-Cresol
Methanol
Methyl acrylate
Methylene chloride
Methyl ethyl ketone
Methyl isobutyl ketone
Methyl methacrylate and methyl methacrylate derivatives
2,2 Methylenebis (3,4,6-trichlorophenol)
Mercury and compounds
Molybdenum and compounds
M-Xylene
Naphthelene
N-Butyl alcohol
Nickel and compounds
Nitrobenzene
2-Nitropropane
O-Cresol
O-Xylene
P-Cresol
Pentachlorophenol
Phthalic anhydride
Phenol
Selenium and compounds
Silver and compounds
Styrene and styrene-derived compounds
Tetrachloroethene
Tin and compounds
Toluene
Toluene diisocyanate
1,1,1 Trichloroethane
1,2,4-Trichlorobenzene
Trichloroethene
2,4,6 Trichlorophenol
Vanadium and compounds
Vinyl acetate and vinyl acetate derived polymers
Vinylidene chloride and vinylidene chloride derived polymers
Xylene (mixed isomers)
Zinc and compounds

b. *Phase 2: How Did EPA Select Potential Constituents of Concern for the Risk Assessment?* Before we began our initial risk assessment analyses in the fall of 1999, and before survey data were available, we selected a subset of 34 constituents (from the 66) to use in developing the risk assessment structure. We believe that it is important to select toxic constituents that are likely to occur across a wider variety of waste streams so that the concentration-based listing will capture more wastes of concern. While it is possible that infrequently occurring constituents could pose risks, we believe it is most effective to address risks from constituents that could be associated with more paint production wastes and occur in larger volumes. To select these constituents, we looked for some indicators that could give us insight into which were more widely used or more likely to occur in wastes. We started with the 66 constituents identified in Table 1 and looked at 1997 TRI data first to find constituent volumes released to waste management units and environmental media. We then looked at RCRA Biennial Reporting System (BRS) data to find how frequently paint manufacturing facilities generated hazardous wastes that contain each of the 66 constituents. (Hazardous waste generators are required to report biennially the listed and characteristic hazardous wastes that they generate by waste code—the Biennial Reporting System. Each hazardous waste code for listed or TC characteristically hazardous wastes is associated with specific hazardous constituents that are the basis of the listing.) We looked at the number of paint manufacturing facilities that reported generating hazardous waste codes associated with the specific constituents we were interested in. While we know that these wastes are already hazardous, we looked at these data as possible indicators of constituents that might be associated with nonhazardous wastes at paint manufacturing operations. We also considered TRI data for two reasons. First, TRI ''releases'' cover a broader range of materials than ''hazardous wastes'' (in the BRS) and include non-hazardous wastes that are not reported to BRS. Also, TRI data provide some indication of the relative amounts or frequency that constituents may be released into the environment.

First, we looked at TRI for the volume of releases of each constituent from facilities in SIC 2851 to on-site landfills, solidification/stabilization, wastewater treatment, and offsite landfills and surface impoundments. We evaluated releases to these units first, because, while we did not yet have the results of the 3007 survey, these management units correspond most closely to waste management scenarios we generally address for listing purposes. We initially identified a list of 20 constituents out of the 66 with the largest volume releases to these management units.

Second, because solvents were heavily represented among the first 20 constituents we identified from TRI data, we focused on the remaining constituents that fell into other use categories, such as pigments, binders, and biocides. We believe that it is important to have a broader representation of other types of constituents, besides solvents, which are used in paint formulations. (We note that some constituents serve more than one purpose in paint formulations.) We considered total TRI releases (including releases to air, surface waters, etc., in addition to releases to the waste management units listed above) for each of the remaining constituents. We also looked at the number of RCRA facilities that are likely to generate the constituent in hazardous waste, based on BRS data. This resulted in adding 13 constituents, including all eight remaining pigments, binders and biocides that had any TRI releases and 5 that were only reported in the BRS.

Third, while we did not have TRI data available for two additional constituents, cobalt and tin, we added them based on our knowledge that they are commonly used as pigments in paints.

We initially identified 35 constituents that met our screening criteria. However, we later dropped one of the 35 constituents (phthalic anhydride) because it degrades too rapidly to model. In summary, we used the 34 constituents listed in Table III.E–2 to develop the risk assessment structure and draft analysis.

c. *Phase 3: How Did EPA Choose Additional Constituents for The Risk Assessment?* Before we completed the risk modeling, we added a limited number of constituents to the 34 we chose initially. We looked at three groups of constituents. First, since we had chosen the initial group of constituents in the fall of 1999, we identified five additional constituents (from the list of 114 constituents with health benchmarks) that met the criteria for risk assessment (the Agency's Office of Research and Development identified physical/chemical properties and SW–846 methods are available). Second, we had 3007 survey responses reporting which of the 66 constituents (candidates for modeling, including the 34 we used to develop the risk assessment modeling structure) occur in non-hazardous waste streams. Finally, we found TRI data for one additional constituent on the list of 66. Ultimately, we chose additional constituents based on the 3007 survey reporting.

First we considered the five constituents (from the initial list of 114, but not included in the 66) for which we received later information identifying physical/chemical properties, and SW–846 methods: these were acetophenone, chlorobenzene, ethyl ether, p-chloro-meta-cresol, and tetrachloroisophthalonitrile. As with the first group of 34 constituents, we considered the available data for further evidence associating the constituents with paint manufacturing facilities. Acetophenone and chlorobenzene are TRI chemicals but had no TRI releases reported by SIC 2851 facilities. Ethyl ether, o-chloro-meta-cresol, and tetrachloroisophthalonitrile are not covered by TRI. In the BRS, four SIC 2851 facilities reported hazardous wastes that were listed, at least in part based on chlorobenzene. We found no BRS reporting of hazardous wastes associated with the other four constituents.

Then, we also considered the additional information reported in the 3007 survey. The survey listed the 66 constituents that were candidates for risk assessment and asked respondents to identify which constituents occur in each of their waste streams, both hazardous and non-hazardous. While response to this question was mandatory, the responses were based on existing knowledge or waste testing already available to the respondent. In discussing these results below, ''reporting frequency'' or ''frequency of occurrence'' refers to the number of times each constituent was reported to occur in a non-hazardous waste stream by a facility. The numbers reflect the total number of waste streams that were reported with identified constituents, not the number of facilities. Some waste streams were reported without any associated constituents.

In survey data, respondents identified 45 of the 66 constituents occurring in their non-hazardous waste streams. Frequency of occurrence ranged from 127 for barium to one for o-xylene and benzyl alcohol. Twenty-nine of the 34 constituents we chose initially for modeling were among the 45. We initially modeled the top 22 in terms of reporting frequency and out of the top 26, we modeled 24. Five of the constituents we modeled were not identified by respondents as occurring in non-hazardous waste streams. These results support the interpretation that our initial approach to choosing constituents was appropriate.

Finally we considered trichloroethene, which was one of the 66 constituents, but was not initially chosen for risk modeling. We found there were TRI releases reported for trichloroethene, so we also looked at survey responses to find how often respondents identified it occurring in their waste streams. We found that trichloroethene was not reported in either non-hazardous or hazardous waste streams. We compared this to responses for several other widely used solvents. Several were reported in both non-hazardous and hazardous waste streams and the frequency of reporting was significantly higher in the hazardous waste streams. For example, toluene was reported in 38 non-hazardous waste streams and 249 listed hazardous waste streams. Xylene was reported in 33 non-hazardous waste streams and 246 listed hazardous waste streams. Ethylbenzene was reported in 6 non-hazardous wastes and 126 listed hazardous waste streams. Comparing ''no reported occurrence'' of trichloroethene in either non-hazardous or hazardous waste streams to the non-hazardous/hazardous reporting for other widely used solvents led us to conclude that trichloroethene is less likely to be a frequently occurring constituent in non-hazardous waste streams than other constituents that actually were reported in the survey as occurring in non-hazardous wastes.[12] Therefore, we did not model trichloroethene. It is not a constituent considered as a basis for the concentration based listing.

We decided to add additional modeling constituents from those identified in the survey results rather than any of the five constituents for which we received additional data that would allow us to conduct risk modeling. We have no TRI data for any of the five constituents with late-arriving information. BRS data provided some evidence that chlorobenzene is associated with hazardous wastes from four paint facilities. In contrast, the survey provides actual reporting from paint manufacturers on the occurrence of constituents in their nonhazardous waste streams. We believe that BRS reporting associated with chlorobenzene at four facilities is less compelling than reporting frequency in the survey as a basis for adding additional constituents for risk modeling.

Therefore, we added the following six constituents for risk modeling based on reported frequency of occurrence in non-hazardous waste streams: butyl benzyl phthalate with 26 occurrences; acrylamide with 22 occurrences; benzene with 11 occurrences; and m-, o-, and p-cresol isomers with 14 occurrences (for m-cresol and o-cresol). We modeled all three cresol isomers because they are sometimes difficult to distinguish with available sampling methods and they often occur together. Also, all three isomers are TC constituents.

In summary we modeled 43 constituents. There are several points to note concerning the constituents that we modeled:

- There are 11 metals on our list of modeling constituents, and we actually modeled 14 because we modeled elemental mercury and divalent mercury, chromium III and chromium VI, and nickel and nickel oxide. Metals exist in a wide variety of chemical species, and this may be an important factor in assessing the fate, mobility, and toxicity of metals in our risk analysis. For the metals noted above, we have sufficient information on mobility and toxicity to model different species. Metals are present in paint manufacturing wastes as simple metal salts, or the metal could be part of a larger organic or inorganic metal compound. For example, for lead there are a number of compounds used in paints, such as lead naphthenate, lead molybdate chromate, lead sulfate, lead chromate, lead oxide, etc. We believe that by modeling these 14 metals, we are in fact representing a broader range of compounds that are likely to be used in paints. As discussed in the Section III.E.3 (see discussion on uncertainty in human health risk results), we recognize that the ionic forms of metals we modeled may over or under represent the mobility of many of these metal compounds. However, given that metal speciation may also change as the constituents move from the waste into the environment, we believe our modeling efforts are a reasonable approach to assessing the risks presented by the metals.
- Fifteen of the constituents are TC constituents. We chose to model these because we were concerned that risk-based levels derived from modeling might be lower than TC concentration levels. We had experience from the petroleum listing where one TC constituent, benzene, was present in the wastes below the TC concentration level and potentially could pose a risk, (see 63 FR 42110, August 6, 1998). In addition, because we intended to conduct a multi-pathway risk assessment that would take into account direct and indirect risks from air and ground water as well as from ingestion of ground water, it was possible that risk-based concentrations for other exposure pathways might be lower than those for ingestion of ground water alone, which is the basis for the TC.
- Fifteen of the constituents are pigments; ten are biocides; 17 are solvents; five are binders; and two are driers (the numbers do not add up to the total number modeled because some constituents have more than one purpose).
- With the addition of the six new modeling constituents, we modeled 34 constituents with 3007 survey reported waste stream occurrences ranging from 127 to two. We modeled the top 30 in terms of reporting frequency in waste streams, with the exception of acetone (discussed below). We also completed modeling for the five constituents modeled initially but not reported in the survey, because there is a possibility that they may occur in the total universe of paint manufacturing wastes.

We did not model acetone, although it was reported at 11 occurrences, because it was removed from the TRI in 1995. It was removed from the TRI because ''* * * acetone: (1) Cannot reasonably be anticipated to cause cancer or neurotoxicity and has not been shown to be mutagenic and (2) cannot reasonably be anticipated to cause adverse developmental effects or other chronic effects except at relatively high dose levels.'' (**Federal Register:** June 16, 1995 (Volume 60, Number 116), pp. 31643–31646.) On the same day, EPA also added acetone to a list of compounds excluded from the definition of a VOC under Title I of the Clean Air Act, based on an Agency determination that acetone has a negligible contribution to tropospheric ozone formation.

[12] Also, generators should know if trichloroethene is in their wastes because it is a TC constituent (D040, trichloroethylene).

Table III.E–2 lists all the constituents that we modeled, the use category that they fall under and their frequency of occurrence when they were reported in non-hazardous waste streams.

TABLE III.E–2.—CONSTITUENTS MODELED FOR RISK ASSESSMENT

Constituent	Purpose	Weighted frequency of occurrence in non-hazardous waste streams
Barium [1]	Pigment	127.4
Zinc	Pigment/Biocide	126.8
Vinyl Acetate	Solvent/binder	98.4
Ethylene Glycol	Solvent	90.0
Copper	Pigment/Biocide	86.7
Chromium III [1]	Pigment	84.6
Chromium VI [1]		(Identified as chromium in the survey)
Cobalt	Pigment/drier	73.0
Styrene	Binder	63.0
Formaldehyde	Biocide	62.8
Lead [1]	Pigment/drier	58.2
Antimony	Pigment	45.9
Silver [1]	Pigment/biocide	45.6
Methanol	Solvent/biocide	40.0
Toluene	Solvent	38.8
Methyl Ethyl Ketone [1]	Solvent	36.9
N-Butyl Alcohol	Solvent	35.6
Acrylonitrile	Binder	35.0
Cadmium [1]	Pigment	34.5
Xylene	Solvent	33.5
Nickel	Pigment	28.3
Nickel oxide	Pigment	(identified as nickel in survey)
Phenol	Solvent/biocide	28.0
Methyl Methacrylate	Binder	27.2
Butyl Benzyl Phthalate [2]	Solvent	26.6
Acrylamide [2]	Binder	22.5
Dibutyl Phthalate	Solvent	22.0
m-Cresol [1,2]	Solvent	7.45
o-Cresol [1,2]	Solvent	7.45
p-Cresol [1,2]	Solvent	
Methyl Isobutyl Ketone	Solvent	11.8
Benzene [1,2]	Solvent	11.0
Tin	Pigment	9.0
Mercury [1]	Pigment/biocide	7.6
Divalent mercury	Pigment/biocide	(Identified as mercury in the survey)
Ethylbenzene	Solvent	6.1
Selenium [1]	Pigment	5.1
Di(2-ethylhexyl) Phthalate	Solvent	2.2
Chloroform [1]	Biocide	
Methylene chloride	Solvent	
2,4 dimethylphenol	Biocide	
Pentachlorophenol [1]	Biocide	
Tetrachloroethylene [1]	Solvent	

[1] Indicates Toxicity Characteristic (TC) constituents.
[2] Indicates constituents added to the risk assessment based on frequency of occurrence reported in the 3007 survey.

5. What Was EPA's Approach to Conducting Human Health Risk Assessment?

Our human health risk analysis for the paint and coating waste streams estimates the concentrations of individual constituents that can be present in each waste stream and provide a specified level of protectiveness to human health and the environment. The human health risk assessment for the paints and coatings listing determination evaluates waste management scenarios that may occur nationwide. A national analysis that captures variability in meteorological and hydro-geological conditions was selected for this listing because paint manufacturing is widespread, and facilities that generate the waste streams of interest are found nationwide.

This risk assessment is intended to limit the risk to individuals who reside near waste management units used for paint manufacturing waste disposal by determining the concentrations of particular constituents that can be managed in paint manufacturing wastes and remain below a specified individual target risk level.

For this listing, we generated risk-based concentration limits in waste streams by estimating the concentration of a constituent that can be managed in the waste streams reported in the 3007 survey and remain below a target risk level for both cancer risk and noncancer human health hazards to 90% of the individuals living near waste management units handling paint manufacturing wastes. Human health impacts are expressed as estimates of excess lifetime cancer risk for individuals (called ''receptors'') who may be exposed to carcinogenic contaminants and as hazard quotients (HQ's) for those contaminants that produce noncancer health effects. Excess lifetime cancer risk is the probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen. A hazard quotient is the ratio of an individual's chronic daily dose of a noncarcinogen to a reference dose (an estimate of daily exposure that is likely to be without appreciable risk or deleterious effects over a lifetime) for exposures to the noncarcinogen. For this listing, the Agency selected a target risk level for excess lifetime cancer risk for individuals exposed to carcinogenic (cancer-causing) contaminants of 1 chance in 100,000 (1E–05). For constituents that are non-carcinogens, the Agency selected the measure of safe intake levels to projected intake levels, a hazard quotient (HQ), of HQ=1.

The use of these risk levels is consistent with the EPA's hazardous waste listing policy and the target risk levels used in past hazardous waste listings (e.g., see 59 FR 24530, December 22, 1994). Risk levels themselves do not necessarily represent the sole basis for a listing. There can be uncertainty in calculated risk values and so other factors are considered in conjunction with risk in making a listing decision. EPA's current listing determination procedure uses as an initial cancer-risk ''level of concern'' a calculated risk level of 1E–05 and/or environmental risk quotients (EQ's) of 1 at any one point in time. Waste streams for which risks are calculated to be 1E–04 or higher, or 1 HQ or higher for any individual non carcinogen, or non carcinogens that elicit adverse effects on the same target organ, generally will be considered to pose a substantial present or potential hazard to human health and the environment and generally will be listed as hazardous waste. Such waste streams fall into a category presumptively assumed to pose sufficient risk to require their listing as hazardous waste. However, even for these waste streams there can in some cases be factors which could mitigate the high hazard presumption. Listing determinations for waste streams with calculated high-end individual cancer risk levels between 1E–04 and 1E–06 always involve assessment of additional factors. For today's proposed listing there are several factors that we considered in setting the risk level of concern, these included: (1) Certainty in the risk assessment methodology, (2) coverage by other regulatory programs, (3) damage cases, and (4) presence of toxicants with unquantifiable risks. We believe a target cancer risk level of 1E–05 and an HQ of 1 is appropriate for this listing, but we welcome comments and supporting data if there is a compelling reason for an alternative target.

To calculate listing levels for constituents of concern, we needed to determine what concentrations at the point of exposure would be associated with levels in the waste for each waste stream and waste management unit. We used three types of analyses to determine the risks associated with the management of paint manufacturing wastes: (1) A probabilistic analysis for all waste management scenarios; (2) a deterministic analysis for all waste management scenarios, and (3) a bounding analysis for on-site management of waste waters in treatment tanks. The results of the bounding analysis demonstrated that given the concentrations of constituents that we expect in paint manufacturing waste the risk generated from paint manufacturing wastes managed in on-site tanks is not significant. The following sections describe the risk assessment.

(1) *Probabilistic Analysis (Monte Carlo Method).* A probabilistic analysis calculates distributions of results (in this case protective waste concentrations for each constituent) by allowing some of the parameters used in an analysis to have more than one value. The model is run numerous times (for this analysis we ran the model 10,000 times) each time with different values selected from the distributions of input parameters. A parameter is any one of a number of inputs or variables (such as waste volume or distance between the waste management unit and the receptor) required for the fate and transport and exposure models and equations that EPA uses to assess risk. In the probabilistic analysis, we vary sensitive parameters for which distributions of data are available. Parameters varied for this analysis include waste volumes, waste management unit size, parameters related to the location of the waste management unit such as climate and hydro-geologic data, location of the receptor, and exposure factors (e.g., drinking water ingestion rates). In some cases, in order to maintain the inherent correlation between parameters, we treat multiple parameters as a single parameter for the purpose of conducting the analysis. We do this to prevent inadvertently combining parameters in our analyses in ways that are unrealistic. For example, we treat environmental setting (location) parameters such as climate, depth to groundwater, and aquifer type as a single set of parameters. We believe that, for example, allowing the climate from one location to be paired with the depth to groundwater from another location could result in a scenario that would not occur in nature.

The probabilistic analysis is conducted using a Monte Carlo methodology. Monte Carlo analysis provides a means of quantifying variability in risk assessments by using distributions that describe the full range of values that the various input parameters may have. Some of the parameters in the probabilistic analysis are set as constant values because (1) there are insufficient data to develop a probability distribution function ; (2) EPA made assumptions to simplify the analysis in cases where such simplifications would improve the efficiency of the analysis without significantly affecting the results; and (3) the analysis has not been shown to be sensitive to the value of the parameter, that is, even if the parameter varies, the resulting risk estimate does not vary significantly. The result of the probabilistic risk assessment is a distribution of risk-based concentration limits or ''listing levels.'' The EPA used the results of the probabilistic risk assessment to determine the regulatory listing levels.

(2) *Deterministic Analysis.* The deterministic method uses single values for input parameters in the models to produce a point estimate of risk or hazard. We used the deterministic analysis to corroborate the results of the probabilistic analysis. For the deterministic analysis, we conduct both a ''central tendency'' and a ''high end'' deterministic risk assessment. These two analyses attempt to quantify the cancer risk or non-cancer hazard for the ''average'' receptor in the population (the central tendency risk) and the risk or hazard for individuals in small, but definable ''high end'' segments of the population (the high end risk). For central tendency deterministic risk analyses, we set all parameters at their central tendency values. For the paint and coatings risk assessment, the central tendency values generally are either mean (average) or 50th percentile (median) values. We use high end deterministic risk analyses to predict the risks and hazards for those individuals exposed at the upper range of the distribution of exposures. EPA's Guidance For Risk Characterization (EPA 1995) advises that ''conceptually, high end exposure means exposure above about the 90th percentile of the population distribution, but not higher than the individual in the population who has the highest exposure,'' and recommends that ''* * * the assessor should approach estimating high end by identifying the most sensitive variables and using high end values for a subset

of these variables, leaving others at their central values.'' As such, for the paint and coatings risk assessment, high end deterministic risk analyses, EPA established a set of the parameters most likely to influence the results of the assessment and set two of these parameters at a time to their high end values (generally 90th percentile values), and set all other parameters at their central tendency. The high-end deterministic analysis results are based on the two most ''sensitive parameters.'' These are the two parameters that when set at their high-end values, generated the highest estimate of risk or hazard. These two most ''sensitive parameters'' vary according to the constituent and pathway evaluated. Appendix C of the risk assessment technical background document shows the two most sensitive parameters for each constituent and pathway. The EPA did not perform a sensitivity analysis on all parameters in this risk assessment. Rather, the parameters we selected to vary in the deterministic analysis were a smaller list based on sensitivity analyses performed on the same models for other listing determinations that determined the most sensitive parameters in our models. For the aboveground pathways, the parameters considered most likely to influence the results were the waste management unit surface area, the distance to the receptor, the meteorological station location, the sorption coefficients for the waste management unit and surficial soil, the receptor's exposure duration, and the volume of paint waste in the waste management unit. For the groundwater pathways, the parameters considered most likely to influence the results included; the distance to receptor well, depth to groundwater, the sorption coefficients, the receptor's exposure duration, and the volume of paint waste in the waste management unit. We did not use the deterministic analysis to develop today's proposed listing levels. The deterministic analysis is discussed in more detail in the Technical Background Document

(3) *Bounding Analysis.* This type of analysis is very conservative but presents a quick and simple way to ''screen out'' potential scenarios of concern. A bounding analysis was used for the on-site tank scenario because, based on previous listing determinations, we did not think volatilization from the small volumes managed on-site was likely to generate a risk of concern. Similar to the deterministic and probabilistic analyses, the results of this risk assessment are the concentration of each constituent that can be managed in a tank and remain protective of human health. To conduct this analysis, the most sensitive or risk-driving parameters in the risk assessment tank model were varied between their high-end and central tendency values. The tank characteristics (i.e., capacity, surface area, and diameter) used in the analysis were based on the tank reported by the facility with the highest waste volume managed in a tank. The tank modeled was a 9000 gallon, aerated waste water treatment tank. For the analysis we assumed there was no biodegradation in the tank. Similar to the deterministic assessment, two high-end parameters were varied at a time to determine the greatest ''high-end'' risk combination. The greatest reported waste volume was always used as one of the high-end parameters in the two parameter combination. The three other high-end parameters were varied between their high-end and central tendency values. These three parameters were; the distance from the waste management unit to the receptor, the duration that the receptor was exposed to the contaminant, and the meteorological location of the waste management unit. Based on the results of this analysis, we determined that the risk of waste water management in on-site tanks is insignificant for all constituents for one of three different reasons: (1) The estimated constituent concentration was greater than 1 million parts per million and therefore was not physically achievable, (2) the estimated constituent concentration was above the constituent's RCRA hazardous waste toxicity characteristic and the waste would already be classified as hazardous, or (3) we determined, based on knowledge of paint formulations, that non-hazardous paint manufacturing waste waters would never contain concentrations of the constituent at the level that may produce a risk (see Section for further discussion).

a. *What Waste Management Scenarios Were Evaluated?* We evaluated four waste management units that represent plausible management scenarios that are likely destinations for paint and coating production waste streams. The modeled units include landfills, surface impoundments, on-site tanks, and off-site tanks. Section III.D describes in detail why these waste management units were selected for evaluation in the risk assessment. The waste management scenarios for each of these units were created using information reported by industry on the management of their non-hazardous paint manufacturing waste streams. In addition, we used information on the national distributions of waste management unit characteristics (e.g., size and waste capacity) collected with surveys conducted for other rulemakings to establish the characteristics of the off-site waste management units.

(i) Type of Waste Management Units and Their Characteristics. We evaluated commercial industrial non-hazardous landfills, surface impoundments, and off-site tanks for the probabilistic and deterministic risk assessment. On-site tanks were also evaluated in a bounding analysis. With the exception of the on-site tanks, each type of waste management unit has a distribution that characterizes the units with respect to capacity and dimension (e.g., area and depth). These dimensions and operating characteristics are important determinants of the extent to which a contaminant may be released from the unit. Each type of waste management unit is assumed to have different operational lifetimes (between 20–50 years) and different lengths of time during which constituents are assumed to be released from the unit (between 30 and 200 years).

For landfills and surface impoundments we evaluated the scenario of disposal in an unlined waste management unit and assessed the impact of the release of leachate from the landfill and surface impoundment to the groundwater. In addition, we assumed that the landfill did not have daily cover and the surface impoundment was open to the air. The primary source of data used to establish the characteristics of landfills and surface impoundments for both the probabilistic and deterministic analysis is our 1985 Screening Survey of Industrial Subtitle D Establishments.[13] There are over 2,850 landfills reported in this survey. Since paint manufacturing facilities reported that their wastes were sent to off-site landfills, the characteristics the sixty-eight landfills reported in this survey to accept wastes in all or in-part from off-site sources were selected for characterizing the landfills included in this assessment.

There were 1,930 surface impoundments reported in the 1985 Industrial D Screening Survey. Twenty-seven of these surface impoundments were not included in the distribution used for this risk assessment because the data were not complete in the survey or the facility indicated that the

[13] Schroeder, K.R. Clickner, and E. Miller, 1987. Screening Survey of Industrial Subtitle D Establishments. Draft Final Report. Prepared for the Office of Solid Waste, U.S. Environmental Protection Agency. Westat, Inc. Rockville, MD.

surface impoundments were only used as backup storage units. A stratified random sample of 200 of the remaining 1,903 surface impoundments was used in the analysis. Data on the surface impoundment total capacity and total 1985 waste quantity were used in the analysis. Surface impoundments were assumed to be operated with varying degrees of aeration. Aeration characteristics were not a parameter reported in the Industrial D survey and in the absence of this data, the distribution of aeration characteristics from the tanks database (described below) was randomly applied to surface impoundments.

For the evaluation of off-site management of waste waters in treatment tanks, a tank database was developed for this analysis that compiled flow rates, treatment methods, and tank volumes. The primary source for these data was EPA's 1986 National Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities (TSDR) Database.[14] Although this database collected information on hazardous waste tanks, this database was used since it is the most comprehensive collection available of information on tank characteristics. Since similar treatment technologies are used for hazardous and non-hazardous waste we believe that the characteristics of non-hazardous tanks is not significantly different from hazardous tanks. This database is a result of a comprehensive survey of 2,626 TSDR facilities, on 1986 waste management practices and quantities. A subset of the data contained information on 8,510 tanks that received wastes from off-site. Since it was not computationally feasible to model all 8,510 of the tanks for this analysis, a sample from the tanks in this survey was used to develop the characteristics of off-site tanks. There were several criteria used in selecting a sample from the tanks in the 1986 survey. Some of the criteria used were: (1) Only those tanks reporting flow rates (demonstrating they were used for waste management) were included in the analysis, (2) only treatment tanks were considered in the analysis and tanks that were closed or covered were not included in the distribution, (3) no reported tanks with a volume the size of a drum or smaller were included since these are likely to be short-term units or containers. From all the tanks that met the above mentioned criteria, a sample of 200 tanks was drawn from the data that comprised the tank distribution. The sampling was conducted to preserve the range and distribution of tanks in the underlying database. To reflect emission characteristics associated with differences within the treatment tank category related to aeration intensity, three different tank categories were identified and modeled: high aerated treatment tanks, low aerated treatment tanks, and nonaerated (quiescent) treatment tanks. Examples of quiescent treatment tanks are clarifiers and filters (such as sand or mixed-media filters). In the absence of aeration, quiescent treatment tanks are still subject to small amounts of agitation during filling and emptying operations if the tank has above-surface intakes. Sorting the tanks in the database into these three categories was done using the data reported in the TSDR category.

(ii) Location of Waste Management Units. Determining the location of waste management units is important for the selection of environmental setting data (e.g., meteorological and hydrological data) for constituent fate and transport modeling. Since we do not know the location of all specific paint production waste disposal, we assumed that waste disposal locations are correlated with the location of the paint production facilities. We also assumed that nonhazardous waste from paint manufacturing facilities is disposed within reasonable transport distances of the facility. Therefore, we created a distribution of locations of paint manufacturing waste treatment and disposal facilities across the United States. The locations of waste management in the distribution are weighted according to the total dollar value of product shipments reported for a State. We assumed that the larger the total dollar value of shipments, the greater the volume of paint production in the State and we weighted the probabilistic analysis accordingly. In other words, the meteorological locations in States with the larger reported dollar value of paint shipments in the probabilistic analysis had more of the 10,000 iterations. The source of information on the dollar value of product shipments is the 1997 Economic Census of Paint and Coating Manufacturing (U.S. Department of Commerce, 1999).[15] The Census reported the dollar value of shipments made by paint manufacturing facilities by State. In all, 36 states reported paint production volumes on a dollar value basis. The Census, however, included only States for which facility data can be reported without disclosing confidential business information. Data cannot be reported if the population of paint manufacturing facilities is so small that confidentiality cannot be maintained if data were reported on a State level. Since the States not included in the 1997 Census may only have a few paint manufacturing facilities, not including these States does not impact this analysis. Locations for modeling were selected first for States according to the volume of paint manufactured and then by the general location of paint manufacturing facilities within the State. The EPA's 1997 Toxic Release Inventory was used to determine the possible location of the paint manufacturing facilities within a State. In many cases the majority of the paint manufacturing facilities were located in several clusters throughout a State. Therefore, in some cases several different meteorological stations and hydrological regimes within a single State were modeled. Forty-nine meteorological stations in 39 states were used in the risk assessment.

(iii) Waste Volumes. In Part III, Section D, we explained how we identified waste volumes reported in the 3007 survey data that represent the distribution of volumes of non-hazardous waste being sent to non-hazardous landfills, surface impoundments, and tanks across the nation. We compiled distributions of waste solids sent to landfills and waste liquids sent to tanks and surface impoundments. Each waste volume has a corresponding weighting factor that represents the number of facilities in the total sampling population that sent a particular waste volume to a particular type of waste management unit. The risk assessment modeling requires the use of volumes going to a waste management unit, therefore the waste quantities here are presented as volumes (in gallons) as opposed to mass (in tons), the waste descriptor that has been used in previous sections of this preamble. For the probabilistic risk assessment the weights were used to determine the frequency a waste volume was evaluated in the 10,000 iterations comprising the Monte Carlo analysis. In general, the waste volumes reported were relatively small when compared to the total waste capacity of the waste management units. For the probabilistic analysis, the volumes of emission control dust going to a landfill range from 40 gallons to 78,650 gallons, the volumes of all the solids going to a landfill range from 5 gallons to 426,739

[14] U.S. EPA. 1987. 1986 National Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities Database.

[15] U.S. Department of Commerce. 1999. Paint and Coating Manufacturing: 1997 Economic Census; Manufacturing Industry Series. EC97M–3255A. U.S. Census Bureau, Washington, D.C. August.

gallons, and the range of aqueous wastes that can be managed in either a surface impoundment or off-site tank is from 151 gallons to 104,225 gallons. For the deterministic analysis, the 50th and 90th percentile waste volumes from each of the volume distributions was used. These volumes are shown in Table III.E–3 below.

TABLE III.E–3.—WASTE VOLUMES USED FOR THE RISK ASSESSMENT

Percentile	Emission control dust (gallons/yr)	Combined solids (gallons/yr)	Liquid wastes (gallons/yr)
Minimum	40	5	151
50th	644	375	12,000
90th	58,340	43,270	26,752
Maximum	78,650	426,739	104,225

b. *What Exposure Scenarios Did EPA Evaluate?* Prior to conducting the risk assessment, we had to establish that there is a plausible scenario under which a receptor might be exposed to contaminants managed in paint manufacturing wastes. Establishing this scenario required that we determine: how the waste is managed, how contaminants can be released from the waste management unit, how contaminants can be transported in the environment to a point of contact with a receptor; and how a receptor can be exposed to a contaminant. For the reasons discussed in Part II, Section D, we chose to evaluate the risk attributable to management of paint production wastes in uncovered biological treatment tanks, uncovered and unlined surface impoundments, and uncovered and unlined non-hazardous industrial landfills.

(i) Release Scenarios From Waste Management Units. We determined that releases from all of the waste management units (tanks, landfills, and surface impoundments) can occur through release of vapor emissions to the air. In addition, particulate emissions to the air from solids disposed in landfills is feasible. For the landfill and surface impoundment waste management scenarios, it was also determined that releases could occur through leaching of waste into the subsurface. We assumed that tanks were sufficiently impermeable that they were highly unlikely to release volumes of waste sufficient to pose an unacceptable groundwater risk. Therefore it was not necessary to develop risk-based concentrations for the groundwater pathway. The mechanisms and pathways we evaluated are as follows:

1. Vapor emissions can remain dispersed in the air, or can be deposited through wet and dry deposition. Specifically, we modeled the concentration of vapor phase contaminants in air, the diffusion of vapor phase contaminants into plants, the diffusion of vapor phase contaminants into surface water, wet deposition of vapors onto soils and surface water, dry deposition of vapors onto soils, and dry and wet vapor deposition onto plants.

2. Particulate emissions can remain dispersed in the air or be deposited through wet deposition (in precipitation) or dry deposition (particle settling). We assume that particulates may be deposited onto soil and surface water through both wet and dry deposition, and onto plants through dry deposition.

3. Leachate can migrate through the unsaturated zone to the saturated zone, where contaminants are transported in groundwater to drinking water wells.

4. Constituents deposited onto soils from vapor and particulate emissions can erode into nearby surface water bodies.

(ii) Routes of Exposure. Human receptors may come into contact with the chemicals of concern present in environmental media through a variety of routes. In general, exposure pathways are either direct, such as inhalation of ambient air, or indirect, such as consumption of contaminated food products. For this risk assessment, human receptors may come into contact indirectly with vapors that diffuse into vegetation, particulates that are deposited onto vegetation, or contaminants that are taken up by vegetation from the soil and ingested in fruits and vegetables, as well as exposure to contaminated beef and dairy products derived from cattle which have ingested contaminated forage, silage, grain, and surface soil. Receptors that ingest fish may also indirectly come into contact with contaminants in air-borne vapors and particulates (through vapor diffusion into surface water, vapor deposition onto surface water, and particulate deposition onto surface water) and runoff and eroded soil that has entered the surface water body.

(iii) Receptors Evaluated. Most paint facilities transport wastes generated during paint production to waste management units located off-site. For the off-site waste management units identified in the RCRA 3007 survey (e.g., landfills) it is not uncommon to have residential, recreational, or agricultural land uses surrounding the management unit. As such, we determined that the following receptors reasonably represent the types of individuals that may be located near the waste management units and could be exposed to contaminants in paint production wastes:

- An adult resident,
- The child of a resident,
- A farmer,
- The child of a farmer,
- A recreational fisher.

Some of these receptors might be exposed through several pathways and some might only be exposed through one pathway. Receptors are evaluated for exposures with respect to chemicals present in ambient air (both vapors and particles), soils, groundwater, fruits and vegetables, beef and dairy products, and fish. The magnitude of the exposure received by a receptor is dependant on the chemical and environmental setting modeled. The following sections describe our primary assumptions regarding the characteristics and activities of each of the receptor types, and the routes by which each receptor is exposed.

Adult Resident and Child of the Resident. We assume that an adult and child can reside near the waste management unit. The residential receptors inhale vapors and particulate matter that are dispersed in the ambient air. We assume that household water is supplied to the residential receptors by a private groundwater well that is located near their home. The adult resident and the child of the resident, drink water that comes from the well. We assume that the adult resident inhales vapors that are emitted from the water used for showering. The residential receptors do not ingest foods that are grown in the vicinity of their home, however, they do incidentally ingest surface soil from their yard. Groundwater exposures were only considered for the residential scenario. It was assumed that contaminated groundwater was not used for crop irrigation or stock water for cattle. In addition, groundwater recharge and subsequent contamination of fish was not considered. In general, the exposure to contaminants through the air pathway and contaminants in the groundwater occurs at very different time scales due to the long transport times associated with most chemicals in the groundwater medium. For example, transport of contamination to a receptor in ambient air can happen within a matter of hours while transport of contaminants to a residential well in groundwater can take hundreds, even thousands of years. As such, we did not add together the exposures from both the air pathway and groundwater pathway. There were a few organic constituents where the contaminant did travel to the receptor well in less than 50 years, however, we did not add together the exposures from these two pathways since the receptor locations for the groundwater and air pathways are different, therefore adding the exposures is not appropriate. We did add together the exposures from different routes for each receptor. For example, for carcinogens, we considered the additive exposure for an adult resident from ingestion of groundwater and inhalation of vapors while showering when it was appropriate.

Adult Farmer and Child of the Farmer. We assume that a farmer raises fruits, exposed vegetables, root vegetables, beef cattle, and dairy cattle in an agricultural field located near the waste management unit. Approximately 42 percent of the exposed vegetables, 17 percent of the root vegetables, 33 percent of the exposed fruits, 3 percent of the protected fruits, 49 percent of the beef, and 25 percent of the dairy products eaten by the farmer are grown/raised on the farmer's agricultural field. We assume that the farmer and the child of the farmer incidentally ingests soil from his/her yard.

Recreational Fisher. We assume that the residential receptor may be a recreational angler. Approximately 33 percent of the fish eaten by the fisher are from a stream located near the waste management unit. The fisher's other characteristics and activities are the same as those of the adult resident.

We establish the locations of all the receptors relative to waste management units based on information obtained from previous national surveys. These surveys are discussed below. Exposure to groundwater occurs through the use of water from drinking water wells, and exposure via non-groundwater pathways occurs through releases to the air. Therefore, ''distance to receptor'' for the groundwater pathways is the distance to the drinking water well that the receptor is using (the ''receptor well''). ''Distance to the receptor'' for non-groundwater pathways is the distance to the residence where the receptor is inhaling air or contacting the soil or the distance to the field where the receptor is growing crops or raising livestock. Consequently, we use different databases to establish ''distance to receptor,'' depending on whether we are evaluating a groundwater or a non-groundwater pathway.

For analysis of the air pathways risks in the deterministic analysis we assume that the receptors live either 75 meters (m) (high end) or 300 m (central tendency) from the waste management unit. The distance of 250 feet (ft) (approximately 75 m) is based on the actual measured distance to the nearest resident for the worst-case facility evaluated in the risk assessment conducted to support the 1990 ''Hazardous Waste Treatment, Storage, and Disposal Facilities-Organic Air Emissions Standards for Process Vents and Equipment Leaks Final Rule'' (55 FR 25454), and was used as distance to the nearest resident for that rulemaking. In the same risk assessment, we identified the receptor distance of 1000 ft (approximately 300 m) as the median distance in a random sample of distances to the nearest residence. For the deterministic analysis, we used the average air concentration and deposition values around the circumference at both 75 m and 300 m. For the probabilistic analysis, we identified the distance of 300 m as the median or central tendency distance from the WMU to the receptor. We then used the 75 m distance as a 10th percentile closest location (high-end) and created a normal distribution of receptor distances to sample from. The lowest and highest receptor distances (0 and 100 percentile) of the distribution were constrained to be between 50 and 550 m. The distance from the WMU boundary to the resident location was randomly selected from this distribution. In addition, the receptors in the probabilistic analysis are located in 16 directions around the entire circumference (360 degrees) of the waste management unit.

For evaluating the groundwater pathway in the deterministic analysis, we assume that a receptor well is located 102 m (high end) or 430 m (central tendency) from the waste management unit, and that the receptor well is located on the centerline of the plume (high end) or halfway between the centerline and the edge of the contaminant plume (central tendency). The 102 m distance is the 10th percentile value in the distribution of distances derived from our 1988 survey of Solid Waste (Municipal) Landfill Facilities. The 430 m value is the 50th percentile value in that same distribution. For the probabilistic analysis, the distance from the waste management unit to the receptor well is based on the complete distribution of distance to the receptor well reported by the survey respondents, and ranges from 0.6 m to 1610 m. For the Monte Carlo analysis we assume that the receptor well is located anywhere within the contaminant plume.

The Technical Background Document for the risk assessment provides a complete discussion of the values of additional parameters that define the characteristics of each receptor, such as the amounts of contaminated food and water they ingest, their inhalation rates, and how long they live near the waste management unit (i.e., their exposure duration).

c. *How did EPA Quantify Each Receptors Exposure to Contaminants?* Exposure is the condition that occurs when a contaminant comes into contact with the outer boundary of the body, such as the mouth and nostrils. Once we establish the concentrations of contaminants at the points of exposure, we can estimate the magnitude of each receptor's contaminant dose. Dose is the amount of contaminant that crosses the outer boundary of the body and is available for adsorption at internal exchange boundaries (lungs, gut, skin). For example, for exposure to a carcinogen through ingestion of contaminated drinking water, dose is a function of the concentration of the contaminant in the drinking water (exposure point concentration), as well as certain exposure factors, such as how much drinking water the receptor consumes each day (the intake rate), the number of years the receptor is exposed to contaminated drinking water (the exposure duration), how often the receptor is exposed to contaminated drinking water (the exposure frequency), the body weight of the receptor, and the period of time over which the dose is averaged. Our primary source of exposure factors is the ''Exposure Factors Handbook'' published by EPA in August 1997. For probabilistic analyses, we used the distributions of exposure factor values provided in the Exposure Factors Handbook. The one situation where we do not develop an expression of dose is the case where we use the Reference Concentration (RfCs) to estimate noncancer hazard for the inhalation exposure route. In this situation, we calculate noncancer hazard from concentration of the contaminant in air and the RfC, without considering exposure factors other than those inherent in the RfC (e.g., inhalation rate, body weight).

Children are an important sub-population to consider in a risk assessment because they are likely to be more highly exposed to contaminants in the environment than adults. Compared to adults, children eat more food and drink more fluids per unit of body weight. This higher rate coupled with a lower body weight can result in higher average daily dose than adults experience. To evaluate childhood exposure for this analysis, a child of a resident and a child of a farmer whose exposure begins between the ages of 1 and 6 was evaluated. For the probabilistic assessment, a start age was randomly chosen between the ages of 1 and 6. The child was then aged for the number of years defined by the exposure duration. As children mature, however, their physical characteristics and behavior patterns change. To capture these changes in the analysis, the life of a child was divided into several cohorts: Cohort 1 (ages 1–5), Cohort 2 (ages 6 to 11), cohort 3 (ages 12 to 19), and cohort 4 (ages 20 to 70). Each cohort has a discrete value (for a deterministic assessment) and a distribution (for a Monte Carlo analysis) of exposure parameters that are required to calculate exposure to an individual. The exposure parameter distributions for each cohort reflect the physical characteristics and behavior patterns for that age range.

d. *How Did EPA Predict The Release and Transport of Constituents From a Waste Management Unit to Receptor Locations?* We conduct contaminant fate and transport modeling and indirect exposure modeling to determine what the concentrations of contaminants will be in the media that the receptor comes into contact with. These concentrations are called ''exposure point concentrations'' (that is, they are the contaminant concentrations at the point where the receptor is exposed to the contaminants.) There are a number of computer-based models and sets of equations that we use to predict exposure point concentrations. In the following sections we briefly discuss these models and equations and their application in the risk analyses.

(i) Landfill Partitioning Model. The landfill model is designed to simulate the gradual filling of an active landfill and the long-term releases from the active and closed landfill cells. The design assumes that the landfill is composed of a series of vertical cells of equal volume that are filled sequentially. We assumed that each cell requires one year to be filled. The formulation of the landfill model is based on the assumptions that the contaminant mass in the landfill cells might be linearly partitioned into the aqueous, vapor, and solid phases. The partitioning coefficients are based on those reported in literature, and are listed in the risk assessment's Technical Background Document. The model simulates the active lifetime of the landfill (30 years) and continues simulating releases until less than one percent of the initial mass is left or for a total of 200 years, whichever occurs first. We assume that the landfill has minimal controls with no liner and no daily cover. However, we assumed that there is no runoff and erosion from the unit. The cover at closure is a soil cover that still permits volatilization. We used the highest 9-year average leachate concentration predicted by the partitioning model as input into EPA's Composite Model for Leachate Migration with Transformation Products (discussed in Section III.E(b)(vii)).

Based on the design assumptions above, we simulated the annual release of chemical mass by leaching to the unsaturated zone underneath the landfill, volatilization to the air pathway, and particle emissions to the air pathway from wind erosion and truck movement during the active lifetime. It is assumed that the contaminant mass emitted as a particulate from the landfill is sorbed to particles in the waste. The model estimates the emission rate of contaminant mass adsorbed to particle sizes less than 30 micrometers (μm). The amount of contaminant mass emitted is assumed to be distributed between four particle size categories, 30 to 15 μm (40%), 15 to 10 μm (10%), 10 to 2.5 μm (30%), and less than 2.5 μm (20%).[16] While the emission control dust may be comprised primarily of the smaller size particles, we assumed that the waste material becomes mixed with other wastes and soils before being released as a particulate, therefore the particle size distribution used for estimating the particulate releases represent the range of particles sizes for all the wastes that may be in a landfill. We did not attempt to assess possible risks from short-term releases of unmixed dust particles that might occur during initial placement of wastes into the landfill cells. However, we do not believe such releases are likely to be significant for several reasons: (1) Dusts sent to landfills are typically contained, and are thus unlikely to cause large scale releases when placed in a landfill, (2) dust volumes are relatively small, especially in comparison to the size of commercial offsite landfills, and would likely be covered with other wastes at the landfill in a short time period, and (3) significant dusting would be minimized by both typical operating practices at landfills (e.g., dust suppressant activities), as well as regulations controlling air releases (e.g., see: Federal regulations for daily cover for municipal landfills at 40 CFR 258.21; widespread State requirements for cover at non-municipal Subtitle D,[17] and requirements under State Implementation Plans approved pursuant to section 110 of the CAA).

In addition, we simulated losses of mass through both anaerobic and aerobic biodegradation and hydrolysis within the landfill. We did not simulate the transport of constituents from the landfill as non-aqueous phase liquids (NAPL's). However, we do not believe that the waste streams evaluated for the landfill scenario will form NAPL's (see Section IV E). In addition, due to the variability of waste stream characteristics across the paint industry, it is impossible to know the exact composition of the waste matrices (e.g., the constituents present and the exact constituent concentrations), therefore, modeling did not take into account the effect of managing multiple solvents in the same waste stream. The management of multiple solvents in a waste may create a ''co-solvency effect'' where the solubility of a solvent may be increased due to the presence of other solvents.

The partitioning model incorporates other assumptions intended to improve the efficiency of the model. These assumptions are described in detail in the risk assessment technical background document. The assumptions include the lack of lateral transport between cells, simulation of only a single cell and then aggregation of results based on the time each cell is filled, and the assumption that waste is added at a constant concentration at a constant rate.

(ii) Surface Impoundment Partitioning Model. The surface impoundment model simulates the disposal of liquid wastes in an unlined surface impoundment and the releases of chemicals during the lifetime of the

[16] ''Compilation of Air Pollutant Emission Factors,'' AP–42, Section 13.2.5: Industrial Wind Erosion, U.S. Environmental Protection Agency, Office of Air and Radiation and Office of Air Quality Planning and Standards, September 1995.

[17] U.S. Environmental Protection Agency, Office of Solid Waste, State Requirements for Industrial Non-Hazardous Waste Management Facilities, October 1995.

unit. The highest 9-year average leachate concentration is then used as input into EPA's Composite Model for Leachate Migration with Transformation Products (see section vii) which estimates the movement of the plume through the saturated and unsaturated zone over a 10,000 year time period. Runoff and erosion from the unit do not occur because we assume the impoundment is a sink in the watershed. We assume that there is no liner other than native soils and that the unit is not covered. The model assumes that the waste in the impoundment consists of two phases: Aqueous liquid and sediment. The model does not simulate any additional phases, such as non-aqueous phase liquids (NAPL's). However, we do not believe that NAPL formation is likely in the wastes evaluated for this listing (see Section IV E). The model simulates the changes at the bottom of the impoundment over time as settled solids fill pore space in native soils and act to reduce chemical transport to underlying soils and groundwater. In addition, a fraction of each surface impoundment is aerated, which enhances biodegradation and increases volatilization of some chemicals. The surface impoundment is assumed to operate 50 years and then undergoes clean closure (that is, all the waste is removed from the unit). Based on the design assumptions, the surface impoundment module simulates annual release of leachate to the unsaturated zone and volatile emissions to the air. The model does not account for redeposition of volatiles into the unit from precipitation. The model accounts for several biological, chemical, and physical processes including hydrolysis, volatilization, sorption as well as settlement, resuspension, growth and decay of solids, activated biodegradation in the liquid phase (that is, a higher rate based on the amount of biomass present) and hydrolysis and anaerobic biodegradation in the sediments.

(iii) Tank Emissions Model. The tank model simulates time-varying releases of constituents to the atmosphere. The tank unit only has volatile emissions (no particulate emissions) and the tank is assumed to have an impervious bottom so that there is no contaminant leaching. The treatment tank is divided into two primary compartments: a ''liquid'' compartment and a ''sediment'' compartment. Mass balances are performed on these primary compartments at time intervals small enough that the hydraulic retention time in the liquid compartment is not significantly impacted by the solids settling and accumulation. In the liquid compartment, there is flow both in and out of the WMU. Solids generation occurs in the liquid compartment due to biological growth; solids destruction occurs in the sediment compartment due to sludge digestion. Using a well-mixed assumption, the suspended solids concentration within the WMU is assumed to be constant throughout the tank. However, some stratification of sediment is expected across the length and depth of the WMU so that the effective total suspended solids (TSS) concentration within the tank is assumed to be a function of the WMU's TSS removal efficiency rather than equal to the effluent TSS concentration. The liquid (dissolved) phase contaminant concentration within the tank, however, is assumed to be equal to the effluent dissolved phase concentration (i.e., liquid is well mixed). The tank model does not consider separate non-aqueous phase liquid (NAPL) in the tank that might exist if a constituent is above its solubility limit. We do not believe that constituents managed in paint production waste will have high enough concentrations in waste waters to form an oily film layer on top of the tank. As such, we believe the modeling performed with this tank model is appropriate.

(iv) Air Dispersion and Deposition Model. The atmospheric modeling performed for this risk assessment provides annual average estimates of air concentrations of chemicals released from the waste management units and annual deposition rate estimates for vapors and particles at various receptor points in the areas of interest. The chemicals that are emitted are either in the form of volatilized gases or fugitive dust. The simulated air concentrations are used to estimate biological uptake from plants and human exposures due to direct inhalation. The predicted deposition rates are used to determine chemical loadings to watershed soils, farm crop areas, and surface waters. The atmospheric concentration and deposition of chemicals were determined through a steady-state Gaussian plume modeling approach using the Industrial Source Complex-Short Term (ISCST3) model. Each of the waste management unit types were modeled as an area source with ISCST3. ISCST3 provides hourly meteorological data and estimates of contaminant concentration, dry deposition (particles only) and wet deposition (particles and gases) for user-specified averaging periods. Dry deposition of vapors was also calculated, but outside the dispersion model. Annual averaging periods were used for this analysis. These long averaging times are consistent with the use of chronic benchmarks in this analysis. The dispersion model uses information on meteorology (e.g., wind speed and direction, temperature) to estimate the movement of constituents through the atmosphere. Modeling was conducted using five years of hourly data obtained from 49 representative meteorological stations throughout the country. Meteorological stations were selected based on the location of paint manufacturing facilities.

Currently, algorithms specifically designed to model the dry deposition of gases have not been verified for the specific compounds in question (primarily volatile organics). In place of algorithms, we used a transfer coefficient to model the dry deposition of gases. A concern with this approach is that the deposition is calculated outside the model. As a result, the mass that we estimate deposits on the ground from the plume is not subtracted from the air concentrations estimated by ISCST3. This results in a slight non-conservation of the mass in the system.

Due to the complexity of the analysis, it was not computationally feasible to run ISCST3 on an hourly basis for the lifetime of all the unit configurations. To reduce the computational burden, we made several simplifications to the air modeling. The dispersion model is sensitive to the surface area of the waste management unit. In order to make the dispersion modeling computationally feasible, we divided the different waste management unit configurations into area-based bins that represented the distribution of surface areas for each of the waste management unit types. For each waste management unit type, the median area for each bin was input into ISCST3 and modeled at each of the 49 meteorological stations. For tanks, each area-height combination was modeled for each of the 49 meteorological locations. For any specific unit, the median air concentration and deposition values for the bin that most closely represented the specific unit's surface area was used. Another simplification used in the dispersion modeling is that a scavenging coefficient for all gases was used based on approximating the gases as very small particles. This approach eliminates the need for running ISCST3 for each specific chemical, thus reducing the overall runtime. This simplification might lead to underprediction of wet deposition for some gases and over-prediction for others depending on the Henry's Law coefficient of the gas.

(v) Overland Transport Model. Addition of constituents to soils, called constituent loading, can result from atmospheric deposition and overland movement of constituents. The primary loading mechanisms of constituents onto soils is by wet and dry deposition predicted with the dispersion model. This constituent deposition was predicted based on the average air concentration and deposition flux for both the buffer area and the agricultural field. We assumed that there was no erosion and runoff from the WMU to the surrounding soils since we assumed that the landfill and surface impoundment were below grade. However, erosion and runoff (overland transport) were evaluated to predict the movement of deposited contaminants onto agricultural fields and into nearby water bodies. Five constituent losses in the surface soils were considered: (1) Leaching of the chemical due to precipitation; (2) erosion of the chemical laterally along with the soil due to water; (3) runoff of the dissolved chemical with the lateral flow of water; (4) biodegradation of the chemical in situ; (5) volatilization losses of the chemical. The Universal Soil Loss Equation (USLE) was used to estimate soil erosion losses. The USLE is an erosion model originally designed to estimate long-term average soil erosion losses from an agricultural field having uniform slope, soil type, vegetative cover, and erosion-control practices. We used a modified form of the USLE to estimate the mass of soil lost per year per unit from the soils around the waste management unit and deposited in the runoff directly onto the receptor site (agricultural field and residential lot) and into a nearby stream. We assume the receptor location is between the waste management unit and the surface water body. The area around the waste management unit is considered for the purposes of our analysis to be an independent, discrete drainage subbasin that is at steady-state. We estimate the soil erosion load from the subbasin to the surface water body using a distance-based sediment delivery ratio, and consider that the sediment not reaching the surface water body is deposited evenly over the area of the subbasin. Using equations, we estimate contaminant contributions to the surface water body and the receptor soil. Soils were characterized within a 20 mile radius around each meteorological station using data obtained from the 1994 U.S. Department of Agriculture's State Soil Geographic Data Base and other relevant sources that are described in Appendix I of the risk assessment's Technical Background Document.

(vi) Surface Water Model. We assume that fish are exposed to waste constituents in surface water. Specifically our modeling assumes that fish are exposed to contaminants in the water column, contaminants sorbed to suspended solids in the water column, and contaminants associated with the bed sediment in the surface water body. The beef cattle and dairy cows are exposed to both dissolved and suspended constituent concentrations in the surface water. The model accounts for four ways in which contaminants may enter the surface water body: (1) Contaminants may be sorbed to eroded soils that enter the surface water body, (2) contaminants may be dissolved in runoff that enters the surface water body, (3) contaminants may be bound to airborne particles that are deposited on the surface water body, and (4) vapor phase contaminants in air may be deposited on the surface water body in precipitation (that is, wet deposition of vapor phase contaminants). The model also accounts for processes that remove contaminants from the surface water body. These include: (1) Volatilization of contaminants that are dissolved in the surface water body and (2) burial of contaminants in the sediment at the bottom of the surface water body. The model assumes that the impact to the water body is uniform, which is more realistic for smaller water bodies than for larger ones. The model estimates the concentrations of contaminants in the water column and bed sediment. We used the water column or bed sediment concentrations and bioconcentration factors or bioaccumulation factors. The water body used in this analysis is a stream located down gradient of the WMU. Depending on the receptor scenario that is evaluated, the stream is either adjacent to the buffer area (the area that separates the WMU from the human receptor locations) or is located adjacent to the agricultural field on the side farthest from the WMU. For modeling purposes, the stream is shaped as a rectangle 5.5 m wide and as long as the width of the agricultural fields. The assumption is that the stream is a typical third-order fishable stream. The stream segment modeled in this assessment is assumed to be homogeneously mixed with a depth of 0.21 meters (including water column and benthic sediments) and has a flow of 0.5 m/s. This stream is the smallest water body that would routinely support recreational fishing of consumable fish. Because we modeled a small stream with a constant flow rate, the stream scenario is a conservative (environmentally protective) estimate of the constituent concentration in a surface water body that results from soil runoff and air deposition.

(vii) Groundwater Model. We used EPA's Composite Model for Leachate Migration with Transformation Products (EPACMTP) to model the subsurface and transport of contaminants that leach from the waste management units (landfills and surface impoundments) and migrate to a residential drinking water well. We assume that the soil and aquifer are uniform porous media and that flow and transport is described by Darcy's law and the advection-dispersion equation, respectively. EPACMTP accounts for the following processes affecting contaminant fate and transport: Advection, hydrodynamic dispersion, equilibrium sorption by the soil and aquifer solids (both in the unsaturated and saturated zones), and contaminant hydrolysis. EPACMTP does not account for preferential pathways such as fractures, macropores, or facilitated transport (i.e., any chemical process that has the potential to speed the transport of a pollutant beyond what is expected), which may increase the migration of constituents.

The groundwater pathway consists of two components: Flow and transport in the vadose zone (that is, the unsaturated zone directly below the unit), and flow and transport in the saturated zone. The primary transport mechanisms in the subsurface are downward movement along with infiltrating water flow in the unsaturated zone and movement along with ambient groundwater flow in the saturated zone. The advective movement in the unsaturated zone is one-dimensional, while the saturated zone module accounts for three-dimensional flow and transport. The model also considers mixing due to hydrodynamic dispersion in both the unsaturated and saturated zones. In the unsaturated zone, flow is gravity-driven and prevails in the vertically downward direction. Therefore, the flow is modeled in the unsaturated zone as one-dimensional in the vertical direction. It is also assumed that transverse dispersion (both mechanical dispersion and molecular diffusion) is negligible in the unsaturated zone. This assumption is based on the fact that lateral migration due to transverse dispersion is negligible compared with the horizontal dimensions of the WMUs. In addition, this assumption is environmentally protective because it allows the leading front of the constituent plume to arrive at the water table with greater peak concentration.

In the saturated zone, the movement of constituents is primarily driven by ambient groundwater flow, which in turn is controlled by a regional hydraulic gradient and hydraulic conductivity in the aquifer formation. The model does take into account the effects of infiltration from the waste source as well as regional recharge into the aquifer. The effect of infiltration from the waste source is to increase the groundwater flow in the horizontal transverse and vertical directions underneath and in the immediate vicinity of the waste source as may result from groundwater mounding. This three-dimensional flow pattern will enhance the horizontal and vertical spreading of the plume. The effect of regional recharge outside of the waste source is to cause a downward dip in the movement of the plume as it moves in the downgradient groundwater flow direction.

In addition to advective movement along with groundwater flow, the model simulates mixing of contaminants with groundwater due to hydrodynamic dispersion, which acts in the longitudinal, (i.e., along the groundwater flow direction), as well as in horizontal and vertical transverse directions. The rate of movement of contaminants may be strongly affected by sorption reactions in both the unsaturated and saturated zone. The effect of sorption is expressed in a retardation factor, which is directly related to the magnitude of the constituent-specific $_{KD}$ value ($_{K.C.}$ in the case of organdies). Constituents with a zero or low $_{KD}$ (or $_{K.C.}$) value will have a retardation factor of 1, or close to it, which indicates that they will move at the same velocity as the groundwater, or close to it. Constituents with high $_{KD}$ values, such as certain semi volatile organic constituents and many metals, will have high retardation factors and may move many times slower than groundwater. EPA has sometimes used the MINTEQA2 equilibrium speciation model to estimate Kd's for a variety of metals rather than relying solely on field measurements. However, recently a number of technical issues have been raised concerning the model and its application.[18] EPA is in the process of evaluating the model to address those issues. Therefore, we have decided not to use MINTEQA2 for today's proposed rule. Once the evaluation is completed and the issues are satisfactorily resolved, EPA may again choose to use the model in an appropriate form in future rulemakings. For today's proposed rule, we used values for metal Kd's that have been derived from field studies and have been published in the scientific literature. An empirical distribution was used to characterize the variability of Kd for chemical contaminants for which sufficient published data were available. However, for chemical contaminants having relatively few published values, a log uniform distribution was used in which a three log unit (three orders of magnitude) expansion was made around the geometric mean of the data. This was done to better account for the variability most often seen in measurements of Kd and to capture the uncertainty that comes from having limited data. Our use of empirically derived partition coefficients assumes that sorption is linear with respect to concentration (i.e., the Kd isotherm is linear). However, sorption is not unlimited and will tend to level off as groundwater concentrations increase beyond the linear range (i.e., Kd isotherm becomes non-linear). This condition is most likely to occur in the unsaturated zone where dilution is limited, if leachate concentrations are sufficiently high.

(viii) Indirect Exposure Methodology. We use a series of ''indirect exposure equations'' to quantify the concentrations of contaminants that pass indirectly from contaminated environmental media to the receptor. For example, contaminants that are transported in air may be deposited on plants or onto the soil where they may accumulate in forage, grain, silage, or soil that is consumed by beef cattle and dairy cattle. Individuals may then ingest contaminated beef and dairy products. Similarly, contaminants may be transported in groundwater to domestic groundwater wells where the groundwater is extracted and used for showering. The water vapor generated in the shower may be inhaled by the receptor. The indirect exposure equations allow us to calculate exposure point concentrations for these pathways and routes of exposure. The indirect exposure equations we use to conduct this risk assessment are presented in the Technical Background Document for the risk assessment.

e. *What Is The Human Health Toxicity of COC's Identified by EPA?* To characterize the risk from human exposures to the constituents of concern, toxicity information on each COC is integrated with the results of exposure assessment. Chronic human health benchmarks were used in this risk assessment to evaluate potential noncancer and cancer risks. We use reference doses (RfDs) and reference concentrations (RfCs) to evaluate noncancer health impacts from oral and inhalation exposures, respectively. Oral cancer slope factors (CSF's), inhalation unit risk factors, and inhalation CSFs are used to evaluate risk for carcinogens. The benchmarks are chemical-specific and do not vary between receptors (i.e., residents, farmers, recreational fishers) or age groups. We use several sources to obtain human health benchmarks. Health benchmarks for this risk assessment were obtained primarily from the most recent Integrated Risk Information System (IRIS) and the most recent Health Effects Assessment Summary Tables (HEAST). IRIS and HEAST are maintained by EPA, and the values from IRIS and HEAST were used in this analysis whenever available [19]. If IRIS or HEAST chronic benchmarks were not available, we sought benchmarks from alternative sources. Provisional EPA benchmarks, Agency for Toxic Substances and Disease Registry minimal risk levels, California Environmental Protection Agency (CalEPA) chronic inhalation reference exposure levels, and CalEPA cancer potency factors were used when values were not available from IRIS and HEAST. The benchmark for lead is unique. Instead of using the benchmarks described above, the Office of Solid Waste and Emergency Response (OSWER) soil screening level of 400 ppm was used as the benchmark for the air pathways in this analysis. The SSL number developed by OSWER accounts for all identified sources of lead exposure (including background). The soil screening level was derived by predicting the concentration of lead that can be in soils in a child's play area such that a typical child would have an estimated risk of no more then 5% of exceeding a 10 ug/dL blood lead level. In addition, the EPA's drinking water action level for lead of 0.015 mg/L was used for the groundwater pathway. We also used a drinking water action level for the groundwater pathway analysis for copper since an ingestion benchmark was not available.

Appendix Q of the Risk Assessment Technical Background Document contains the toxicological profiles used in our analysis. The studies used as the basis for each of these benchmarks have

[18] Norris, C.H. and C.E. Hubbard, 1999. Use of MINTEQA2 and EPACMTP to estimate groundwater pathway risks from the land disposal of metal-bearing wastes. Prepared for Environmental Defense Fund, Friends of the Earth, Hoosier Environmental Council, and Mineral Policy Center.

[19] We are aware that health benchmarks for several constituents of concern or potential constituents of concern are currently being reevaluated in IRIS. Reviewers should note that if the IRIS health benchmarks change, the Agency would likely use the most current benchmarks as the basis for setting concentration levels.

been reviewed and summaries of these studies, along with reference to the complete studies, are presented in Appendix Q of the Risk Assessment Background Document.

f. *What Are The Results From The Risk Assessment?* We developed concentration limits based on the following waste management unit/waste stream combinations:

- Emission control dust managed in a landfill.
- Combined volumes of emission control dust, sludges from waste water treatment, and solid off-specification production wastes (called ''combined solids'' in the results table) going to a landfill.
- All waste waters managed in a surface impoundment.
- All waste waters managed in tanks.

For the landfill and surface impoundment scenarios we have risk-based concentration limits for the air and groundwater pathways. We assumed that tanks were sufficiently impermeable that they were highly unlikely to release sufficient volumes of waste to pose an unacceptable groundwater risk that therefore it was not necessary to develop risk-based concentrations for the groundwater pathway. Other than mercury, the air pathway is not relevant for metals managed in waste waters because of their low volatility.

The small waste volumes generated by the paint and coatings manufacturing industry resulted in most of the potential constituents of concern not creating an unacceptable risk. For example, the central tendency waste volume for emission control dust is 2.44 m^3 annually (approximately 644 gallons). When compared to the central tendency capacity of a landfill cell (the annual capacity of a landfill over a 30 year life), the landfill cell is more than 1000 times larger. This results in a thousand fold dilution effect for the leachate when waste is placed in a landfill. Another way to put the waste volumes into perspective is to consider that the central tendency emission control dust waste volume reported by the paint and coating facilities comprises only 0.07% of the capacity of a median sized landfill.

Most of the constituents screened out of the air pathway because the predicted concentration limits were either greater than 1 million parts per million (physically impossible) or greater than what the EPA expects to be managed in paint manufacturing wastes. Specifically, out of the 43 constituents evaluated in both the landfill and surface impoundment scenarios, only 5 had air pathway concentration limits below 1 million parts per million (ppm). In the tank scenario, only 3 constituents had protective waste concentrations that were below 1 million ppm.

Table III.E–2 shows the calculated risk-based concentration levels for all the possible constituents of concern in each of the waste stream scenarios evaluated[20]. The results are the total concentration in either mg/kg for solids (landfills) or mg/L for liquids (surface impoundments and off-site tanks) that can be managed in the units and remain protective of human health. The concentration levels in Table III.E–4 represent the probabilistic results at the 90th percentile risk level based on individuals living closest to the waste management unit. In other words, these concentration numbers meet a target cancer risk level of 10–5 or hazard quotient of 1 for 90% of the receptor scenarios we evaluated. As discussed previously, we are attempting to calculate estimates of exposure in the upper end of the distribution (i.e., above 90th percent), while avoiding estimates that are beyond the true distribution. EPA guidance for risk characterizations states that ''the 'high end' of the risk distribution (generally the area of concern for risk managers) is conceptually above the 90th percentile of the actual (either measured or estimated) distribution. This conceptual range is not meant to precisely define the limits of this descriptor, but should be used by the assessor as a target range for characterizing 'high-end risk'.[21]'' Therefore, a high-end estimate that falls within the range (at or above the 90th percentile but still realistically on the distribution) is a reasonable input to a decision.[22]

We are soliciting comment on our use of the 90th percentile risk level, rather than other high-end risk levels, such as the 95th percentile, to set the regulatory concentration. If we used the 95th percentile results, the calculated listing levels would be about a factor of 3 lower. In addition, if we used the 95th percentile results, we would consider adding an additional constituent in the listing for liquid wastes (methanol; see Section IV.A for a list of the constituents we are proposing for listing). Details of the levels calculated using the 95th percentile are given in the Technical Background Document for the risk assessment.

In this listing we are proposing to set the levels at the 90th percentile, because we believe that the 90th percentile levels are protective. We have limited information on constituent levels in wastes because, for the reasons stated earlier, we did not sample waste streams. Thus, we do not know with any certainty that a large fraction of paint production wastes will be close to the levels derived from either the 90th or 95th percentile. Based on the limited data from our survey of the industry, we expect that many of the paint production wastes generated will not approach these concentrations, but will likely be well below the proposed listing levels. Thus, we think that the paint production waste that would remain nonhazardous at the proposed levels would pose risks below that indicated by the benchmark risk-level at either the 90th or 95th percentile.

We are proposing to establish a concentration-based listing that sets a threshold level below which wastes would not be considered hazardous. This is different from the usual listing determinations we have made in the past. In a traditional listing, all wastes meeting the listing description are regulated as hazardous, with no provision to test for levels of hazardous constituents present. In a traditional listing, if we determined not to list a waste, then all of the waste would go unregulated and the risk remains unaffected. A concentration-based listing, however, would regulate the higher risk wastes and potentially leave lower risk wastes unregulated. This means that by setting the listing levels at the 90th percentile, we are ensuring that the residual risk for the unregulated wastes would likely be below the risk associated with the risk based on an assessment of all wastes. Therefore, we believe that using the 90th percentile levels to set the listing levels is appropriate for this concentration-based listing. Note that we also recently proposed to use the 90th percentile risk levels to set listing levels in the listing for two wastes from the dyes and pigments industries (64 FR 40192, July

[20] Reviewers should note that inputs used in he modeling to support today's proposal may change, and minor modifications to the model itself may be made as a result of ongoing internal quality assurance/quality control reviews, internal peer review and public comments. As a consequence, the proposed constituent levels may change as well. Reviewers should bear in mind that levels that increase or decrease sufficiently could result in adding or deleting constituents from the listing, based on whether the risk-based levels are likely to occur in paint production wastes.

[21] ''Guidance on Risk Characterization for Risk Managers and Risk Assessors'', by then Deputy Administrator F. Henry Habicht, 1992.

[22] The distributions are distributions of concentrations that when found in paint production wastes will generate risks of 10–5 or an HQ of 1 for individuals living closest to paint manufacturing waste facilities. The ''90th percentile'' then is the concentration in paint manufacturing waste at which 90% of the individuals living closest to paint manufacturing waste management facilities will be protected to these levels.

23, 1999); this was also a concentration-based listing that established a threshold, below which wastes would not be listed. For traditional listing decisions, we considered a range of high-end risk results, including a range of probabilistic results at or above the 90th percentile, e.g., see the proposed listings for wastes from the production of chlorinated aliphatics (64 FR 46476, August 25, 1999) and inorganic chemicals (65 FR 55684, September 14, 2000).

TABLE III.E–4.—CALCULATED RISK-BASED CONCENTRATION LEVELS FOR POSSIBLE CONSTITUENTS OF CONCERN IN PAINT AND COATINGS WASTE [1]

Constituents	Emission control dust (mg/kg)		Combined solids (mg/kg)		Waste waters in surface impoundments (mg/L)		Waste waters in off-site tanks (mg/L)
	Air pathway	Ground-water pathway	Air pathway	Ground-water pathway	Air pathway	Ground-water pathway	
Acrylamide	E	3.1E+02	E	4.7E+02	2.3E+05	1.2E+01	E
Acrylonitrile	1.3E+05	4.3E+01	1.7E+05	6.0E+01	1.9E+04	9.3E+00	6.9E+04
Antimony	E	2.3E+03	E	3.2E+03	M	3.9E+02	M
Barium	E	E	E	E	M	E	M
Benzene	6.3E+05	3.1E+04	7.9E+05	4.7E+04	1.0E+05	5.6E+02	1.9E+05
Butylbenzylphthalate	E	L	E	L	E	E	E
Cadmium	E	1.3E+05	E	2.8E+05	M	3.9E+04	M
Chloroform	E	6.0E+05	E	E	E	1.5E+02	E
Chromium III	E	E	E	E	M	E	M
Chromium VI	E	6.8E+04	E	6.6E+04	M	8.8E+03	M
Cobalt	E	E	E	E	M	E	M
Copper	E	E	E	E	M	E	M
Cresol, m	E	E	E	E	E	2.2E+04	E
Cresol, o-	E	E	E	E	E	2.5E+04	E
Cresol, p-	E	E	E	E	E	2.6E+03	E
Di(2-ethylhexylphthalate)	E	L	E	L	E	E	E
Dibutylphthalate	E	L	E	L	E	E	E
Dichloromethane	E	2.4E+05	E	3.3E+05	E	4.5E+03	E
Dimethylphenol 2,4-	E	E	E	E	E	1.7E+04	E
Divalent mercury	6.0E+05	E	8.7E+05	E	2.5E+04	6.4E+05	E
Ethylbenzene	E	L	E	L	E	1.1E+04	E
Ethylene glycol	E	E	E	E	E	7.9E+05	E
Formaldehyde	E	9.3E+05	E	E	E	8.2E+04	E
Lead	E	E	E	E	M	E	M
Mercury	1.6E+05	E	2.1E+05	E	5.9E+03	E	1.0E+04
Methanol	E	E	E	E	E	2.0E+05	E
Methyl ethyl ketone	E	1.5E+05	E	2.2E+05	E	8.2E+03	E
Methyl isobutyl ketone	E	7.3E+04	E	1.2E+05	E	3.4E+02	E
Methyl methacrylate	E	2.8E+04	E	4.1E+04	E	2.1E+03	E
N-butyl alcohol	E	9.7E+05	E	E	E	4.1E+04	E
Nickel	E	E	E	E	M	E	M
Nickel oxide	E	B	E	B	M	B	M
Pentachlorophenol	E	9.6E+04	E	1.6E+05	E	1.0E+04	E
Phenol	E	E	E	E	E	2.7E+05	E
Selenium	E	2.5E+04	E	3.4E+04	M	6.1E+03	M
Silver	E	E	E	E	M	E	M
Styrene	E	E	E	E	E	4.6E+03	E
Tetrachloroethylene	E	1.4E+04	E	2.1E+04	E	4.8E+02	E
Tin	E	E	E	E	M	E	M
Toluene	E	E	E	E	E	1.2E+03	E
Vinyl acetate	E	G	E	G	E	G	E
Xylene (mixed isomers)	E	L	E	L	E	3.9E+03	E
Zinc	E	E	E	E	M	E	M

[1] Levels represent the 90th percentile protective waste concentration derived from the probabilistic analysis.
L = screened out of the groundwater due to no leachate.
E = risk-based waste concentration exceeds 1 million (1E+06) parts per million.
B = screened out of the pathway due to a lack of a human health toxicity benchmark.
M = not included in the risk analysis for that pathway since the constituent is a non-volatile metal.

g. *What Is The Uncertainty in Human Health Risk Results?* Uncertainty is a description of the imperfection in knowledge of the true value of a particular parameter. This risk assessment has inherent limitations that lead to uncertainty in our risk estimates because of the complexity associated with simulating the behavior of a chemical moving through the environment from disposal in a management unit, to exposure points in various environmental media, and subsequent impacts on receptors. As explained below, limitations also result from the amount, type, and quality of the data used in our assessment, the set of exposure pathways evaluated, and the types of waste management units considered. Because of the number of facilities that manufacture paint and coatings, it was not feasible for us to directly measure data such as facility/site characteristics (for example, unit area and volume; depth to groundwater; aquifer thickness; hydraulic conductivity; location of wells; type of ecological receptors; behavioral characteristics of receptors) at each representative site to estimate risk.

This section discusses the major areas of uncertainty in risk assessments as classified by the EPA: scenario uncertainty, model uncertainty, and parameter uncertainty.

(a) Scenario uncertainty results from the assumptions we make regarding how receptors become exposed to contaminants. This uncertainty occurs because of the difficulty and general impracticality of making actual studies of all activities involved in the management of a waste and the human activities that occur around the waste management unit.

• This risk assessment does not consider the additive risk from exposure to multiple constituents. Chemical mixtures can display both synergistic and antagonist behavior with regard to risk. In general, however, the overall risks of a mixture are very likely to be greater than that of exposure to a single chemical. Therefore not adding exposures across the chemicals is an area of uncertainty that leads to an underestimate of total risk. We did not calculate the additive effects from multiple-chemical exposure since there was not information on the concentrations or co-management of particular constituents. In addition, for a concentration based listing it is not reasonable to set standards for a constituent that are developed based on the assumed presence of other constituents that have the same health affect. Whether or not a particular chemical mixture poses an additive risk or hazard depends on the targets (tissue, organ, or organ system), the concentrations of all the constituents in the mixture, and the mechanisms of action of the individual chemicals. Without information on the co-management of constituents, it was not feasible to consider additive risks.

• In certain cases, EPA performs a risk assessment on wastes that contain contaminants that also are present in the environment as a result of both natural processes and anthropogenic activities. Under these circumstances, receptors potentially receive a ''background'' exposure that may be greater than the exposure resulting from release of contaminants from the waste. For national analysis like this assessment, the inclusion of background concentrations as part of the analysis is not feasible due to (a) the variability of background concentrations nationwide and (b) the lack of data on national background concentrations for each constituent.

(b) Parameter uncertainty occurs when (1) there is a lack of data about the parameters used in the equations, (2) the data that are available are not representative of the particular instance being modeled, or (3) parameter values cannot be measured precisely and/or accurately because of limitations in measurement technology. Random, or sample errors, are a common source of parameter uncertainty that is especially critical for small sample sizes. More difficult to recognize are nonrandom or systematic errors that result from bias in sampling, experimental design, or choice of assumptions.

• The age of several of the databases used in this analysis to characterize the waste management units or the location of the receptors leads to uncertainty in the analysis. These databases contain information collected by the EPA in several surveys during the mid- to late 1980's. While these databases represent the best available information the Agency had at the time of this analysis, uncertainty exists in the analysis on changes in waste management practices or residential locations that may have occurred during the past decade. The uncertainty associated with these data may lead to an over or under estimate of risk.

• The sorption coefficient, K_d, which is used in the source partition model, the groundwater model, and in modeling constituent concentration in surficial soils, is an important parameter for modeling the fate and transport of metals in the environment. In previous analyses, K_d values were calculated using MINTEQ but, because of comments on the validity of some of the data upon which MINTEQ calculations are based, EPA decided, for this analysis, that K_d values would be derived from literature values. A comprehensive review of the literature was undertaken to compile K_d data for an earlier rulemaking (Inorganic Chemicals Listing Determination, 65 FR 55684, September 14, 2000.) Despite this substantial earlier effort, considerable uncertainty remains in the literature-based values of K_d used in this analysis because data concerning K_d values for particular constituents reported in the literature were limited. In addition, reported values often were not accompanied by qualifying information. Conditions that affect K_d values (e.g., constituent concentration, metal species evaluated, pH, experimental technique) are often not reported in the literature making interpretation of results difficult. For these reasons, substantial uncertainty concerning the values of K_d remain.

• Very little data were available on the physical and chemical characteristics of paint manufacturing waste. To address this, assumptions on the waste characteristics are based on general knowledge of paint and other similar industrial wastes. In this analysis, except for constituent concentration, which was calculated, EPA assumes that the paint manufacturing waste is mixed with other generic industrial wastes. Therefore, general waste characteristics, including default assumptions for the waste parameters (e.g., fraction of organic carbon, pH), were used.

• We used waste volume data in this risk assessment provided by the facilities as part of our RCRA 3007 survey. Since the survey was not a census, there is some uncertainty associated with the waste volume distribution. This uncertainty may lead to an over or under estimate of risk.

• We typically use regional databases to obtain the parameter values necessary to model contaminant fate and transport. Because the data that we used are not specific to the facilities at which the actual wastes are managed, the data represent our estimates of the generic site conditions. For an analysis where waste management locations are so variable, we believe this type of approach is reasonable and is the best method to address the fate and transport of constituents. Nevertheless, the use of these databases in lieu of site-specific data may result in either overestimates or underestimates of risk.

• Sources of uncertainty in toxicological benchmarks include one or more of the following: extrapolation from laboratory animal data to humans, variability of response within the human population, extrapolation of responses at high experimental doses under controlled conditions to low doses under highly variable environmental conditions, and adequacy of the database (number of studies available, toxic endpoints evaluated, exposure routes evaluated, sample sizes, length of study, etc.). Toxicological benchmarks are designed to be conservative (that is potentially overestimate risk) because of the uncertainties and challenges associated with condensing toxicity data into a single quantitative expression. Uncertainty factors are applied to address limitations of the available toxicological data and are necessary to ensure the RfD or RfC is protective of individuals in the general population. The use of uncertainty factors is based on long-standing scientific practice. Uncertainty factors, when combined commonly range from 10 to 1000 depending on the nature and quality of the underlying data. The RfD/RfC methodology is expected to have an uncertainty spanning perhaps an order of magnitude.

• We recognize that significant uncertainties and unknowns exist regarding the estimation of lifetime cancer risks in children. We estimated the risk of developing cancer from the estimated lifetime average daily dose and the slope of the dose-response curve. A cancer slope factor is derived from either human or animal data and is taken as the upper bound on the slope of the dose-response curve in the low-dose region, generally assumed to be linear, expressed as a lifetime excess cancer risk per unit exposure. However, individuals exposed to carcinogens in the first few years of life may be at increased risk of developing cancer.

• The non-cancer toxicological effects in children is also an area of uncertainty. Non-cancer reference doses and reference concentrations for children are based on comparing childhood exposure, for which we have age-specific data, with adult toxicity measures, where adequate age-specific dose-response data is lacking. This mismatch results in a large amount of uncertainty in the estimation of hazard quotients for children. This would sometimes result in an overestimation of children's risk and sometimes in an underestimation. This issue is still under investigation in the scientific community and no consensus has been reached.

(c) Model uncertainty is associated with all models used in all phases of a risk assessment, because models and their mathematical expressions are simplifications of reality that are used to approximate real-world conditions and processes, and their relationships. Computer models are simplifications of reality, requiring exclusion of some variables that influence predictions but cannot be included in models due either to increased complexity or to a lack of data on a particular parameter. Models do not include all parameters or equations necessary to express reality because of the inherent complexity of the natural environment, and the lack of sufficient data to describe the natural environment. Because this is a probabilistic assessment that predicts what may occur with the management of certain paint manufacturing wastes under assumed scenarios, it is not possible to compare the results of our models to any specific situation that may exist. The risk assessor needs to consider the importance of excluded variables on a case-by-case basis because a given variable may be important in some instances and not in others. A similar problem can occur when a model that is applicable under average conditions is used for conditions that differ from the average. In addition, in some instances choosing the correct model form is often difficult when conflicting theories seem to explain a phenomenon equally well. In other instances, the Agency does not have established model forms from which to choose to address certain phenomena, such as facilitated transport. We selected models used in this risk assessment based on science, policy, and professional judgement. Most of the models selected have been verified and some have been validated. In addition, most of these models have been peer reviewed. These models were selected because they provide the information needed for this analysis and because we generally consider them to be state-of-the-science. Even though the models used in the risk analyses are used widely and have been accepted for numerous applications, they each retain significant sources of uncertainty. Evaluated as a whole, the sources of model uncertainty in our analysis could result in either an overestimation or underestimation of risk. Specific areas of modeling uncertainty in this analysis are:

• There were constituents identified as materials used in paint manufacturing that were not modeled in this risk assessment due to a lack of information on how they behave when introduced to the environment. Our fate and transport modeling is limited to those constituents for which we have (1) the physical/chemical parameters necessary to run our models and (2) adequate information on toxicity to understand potential health impacts from exposure. In selecting constituents of concern, we found multiple constituents that were complex inorganic compounds containing more than one metal of concern and organometallic compounds (compounds containing both a metal and organic constituents) that can be used in manufacturing paint. For example, compounds such as lead chromate molybdate and lead naphthenate may be used as ingredients in paint. An adequate set of both the physical/chemical parameters and toxicity information for modeling fate and transport and predicting risk to human health are lacking for these metal complexes. The technical background document for the risk assessment contains the information we found on a set of organometallics. Due to this absence of data, we simulate the risk presented by these multiple compounds by modeling the ionic form of the metal. For example, the model predictions for lead are used to represent the complex lead inorganic metal compounds and lead organometallic compounds that may be used in paints. Since so little is known about these complex metal compounds and what their fate may be in the environment, our modeling may over or under-estimate the actual risks. In addition, for metals transformations may take place as the pH of the waste or media can change the state of the metal, sometimes to a less toxic form and sometimes to a more toxic form. The risk assessment did not model transformation products or changes in metal species.

• Exposure modeling relies heavily on default assumptions concerning population activity patterns, mobility, dietary habits, body weights, and other factors. There are some uncertainties associated with some of the data used for these parameters. Although it is possible to study various populations to determine various exposure parameters (e.g., age-specific soil ingestion rates or intake rates for food) or to assess past exposures (epidemiological studies) or current exposures, risk assessment is about prediction. Therefore, long-term exposure monitoring in this context is infeasible. The Exposure Factors Handbook provides the current state-of-the-science concerning exposure modeling and assumptions and is used in this risk assessment. To the extent that actual exposure factors vary from the assumptions in this risk assessment, risks could be underestimated or overestimated.

• In modeling the fate and transport of chemicals in groundwater, we did not assess complex hydrogeology such as karst or highly fractured aquifers. Some fraction of the groundwater settings in this analysis have fractured flow. In general, fractured flow in groundwater can channel the contaminant plume, thus allowing it to move faster and more concentrated than in nonfractured flow environment. As a result, our modeling may under or over estimate the concentrations in the groundwater.

• Finally, there is uncertainty in predicting the movement of contaminants over long periods of time. We assess the risk to receptors for the groundwater pathway over a time period of 10,000 years. There are significant uncertainties regarding how exposure, scientific, and environmental assumptions will change over time, and the modeling methodology does not change these assumptions over this 10,000 year period.

We request comments on each of these areas of uncertainty, including their potential impact on our conclusions and whether data are available to improve our analysis.

6. What Was EPA's Approach To Conducting the Ecological Risk Assessment?

Waste management activities cannot only impact the health of individuals living near a WMU, but can also have adverse effects on other organisms and natural systems. For example, wildlife can come into contact with constituents released from WMUs by swimming or living in contaminated waters or by drinking or catching prey such as fish from contaminated waters. For this risk assessment, the EPA conducted an ecological risk screening analysis for all the waste management units evaluated for the human health risk assessment. The purpose of this analysis was to identify whether there is potential for adverse ecological effects from the management of paint production waste in landfills, surface impoundments, and off-site treatment tanks. We performed this ecological risk assessment with a two tiered approach. For the first tier, we assumed that each of the constituents evaluated had a concentration in the waste of 750,000 parts per million. This concentration was a starting number for the analysis and does not have any significance to the way in which paint wastes are currently managed. This waste concentration was selected as a concentration level to perform a screening analysis with since it is greater than what the EPA expects would be managed in paint manufacturing wastes. All constituents except for mercury and lead did not pose an unacceptable risk to ecological receptors at this concentration. For these two constituents, we performed a second level of analysis. For mercury and lead, we predicted what concentrations could be managed in each waste management unit to ensure that all ecological receptors experience a hazard quotient of 1 or less when compared to the 90th percentile environmental media concentrations. These concentrations were 270,000 ppm and 7400 ppm for lead and mercury respectively. Based on these concentrations we determined that lead and mercury in paint manufacturing wastes do not pose a threat to ecological life. Based on our knowledge of paint formulations and information we received on constituent concentrations from our 3007 survey, we do not expect paint production wastes to contain either lead or mercury at the levels we predicted would pose a hazard to ecological receptors. In addition, since lead and mercury are regulated as hazardous wastes with the toxicity characteristic, we believe that paint manufacturing wastes that have high levels of these constituents will already be regulated as hazardous waste.[23] Although we modeled high concentrations in the waste, we believe that risks were not found to ecological receptors in this screening level risk assessment because of the small waste volumes of non-hazardous waste that are being managed in the waste management units.

The models described in Section III were used to estimate the release of these concentrations from the waste management units, fate and transport of the constituents in the environment, and ultimately, the concentration of each constituent in the different environmental media (i.e., surface waters, soils). The ecological screening analysis compares these modeled media concentrations to ecologically protective media concentrations called chemical stressor concentration limits (CSCL's). The result of this comparison is a ratio called a hazard quotient. When the hazard quotient exceeds 1, there is potential for adverse effects to the ecological receptor. If the hazard quotient is equal to or less than 1, we do not expect adverse effects for a particular ecological receptor. The amount by which the hazard quotient exceeds 1 suggests the potential for adverse ecological effects; however, the screening results do not demonstrate actual ecological effects, nor do they indicate whether those effects will have significant implications for ecosystems and their components.

a. *How Were Ecological Exposures Estimated?* Similar to estimating human receptor exposures, we estimated ecological receptor exposures based on simulated contaminant concentrations in the various environmental media and food items, pathway specific ingestion rates, and receptor type-specific body weights. For this analysis, however, the EPA determined the upper bound constituent concentration that can be present in the emission control dust, combined solids, and aqueous waste and modeled the fate and transport of these constituents into the environment. The resulting media concentrations were then compared to ecological receptor chemical stressor concentration limits. The exposure pathways included in this analysis were (1) root uptake of constituents in soil or sediment by plants, (2) biological uptake of constituents in surface water by aquatic animals (e.g., fish or aquatic invertebrates); (3) biological uptake of constituents in sediment by benthic invertebrates; (4) biological uptake of constituents in soil by soil invertebrates; and (5) ingestion of constituents in surface water, soil, sediment, or food items (plants and animals) by terrestrial vertebrates. This assessment did not take into account the dermal absorption of constituents in surface water or soil by terrestrial vertebrates or the inhalation of volatile constituents in air. There are not enough data available on these types of exposures to wildlife to include them in this risk assessment. The 90th percentile media concentrations were then compared to CSCLs to determine the hazard quotient for each ecological receptor evaluated.

There were several simplifying assumptions made for this analysis that over-estimated the potential hazard to ecological receptors. For example, the exposures are estimated assuming that the receptors derive all their food from the contaminated area and the receptors diets consist predominantly of items with the highest contaminant uptake rates. The methodologies and equations used for the ecological receptor exposure estimates are fully described in the Technical Background Document for the risk assessment.

b. *What Ecological Receptors Did The EPA Evaluate?* Two general types of receptors were evaluated in the ecological assessment. For exposure through direct contact with contaminated media, the receptors were multispecies communities such as the soil invertebrate community or the terrestrial plant community. For indirect exposure through ingestion, the receptors are single species populations, such as white-tailed deer or raccoons and include representative trophic levels and feeding strategies. Evaluating risk to receptor populations and communities included consideration of both aquatic and terrestrial habitats. Within each habitat, risk was evaluated at all trophic levels (*i.e.,* position within the food chain) and for all feeding strategies (*e.g.,* plant feeder, predator). Although actual WMU sites were not defined, it was assumed that WMUs occur in a variety of settings that include terrestrial, wetland, and aquatic systems. Thus, the ecological receptors evaluated in this risk assessment include representative plants and animals from several different terrestrial, wetland, and aquatic habitats. In general, the receptors occur throughout most of the continental United States or throughout broad regions, such as east of the Mississippi River.

Relevant trophic levels and feeding strategies (*i.e.,* herbivorous, omnivorous, and carnivorous diets) were established using simple food webs that describe dietary composition and predator-prey relationships in each of the three habitat types. Receptors representing each feeding strategy at each trophic level were selected. In addition, the receptors represent a cross section of general taxa at each trophic level. For example, invertebrates as well as vertebrates were included, and vertebrate receptors include amphibians, mammals, and birds.

The ecological assessment does not specifically address federally listed threatened or endangered species.

c. *How Did EPA Consider The Toxicity of Constituents in The Ecological Risk Assessment?* The calculation of ecological risk for receptor populations is based on the implicit assumption that each receptor species forages only within the contaminated area, regardless of the size of its home range. For smaller animals, this assumption has little impact on the estimates of exposure. However, for larger animals with more extensive foraging areas, this assumption may overestimate exposure if the animal's foraging patterns tend to be evenly spread over the home range that extends beyond the contaminated area.

For the species specific receptors (both mammals and birds), the overall approach used to establish ecotoxicological benchmarks is similar to the methods used to establish RfDs for humans. Each method uses a hierarchy for the selection of toxicity data and extrapolates from a test species to the species of interest. However, there are fundamental differences in the goals of noncancer risk assessments for humans and ecological receptors. Risk assessments of humans seek to protect the individual while risk assessments of ecological receptors seek to protect

[23] Such high levels of mercury in paint manufacturing are also unlikely due to existing regulations controlling the use of mercury in paint. Prior to the 1990s, paint manufacturing used mercury in paints at low levels (e.g., phenylmercuric acetate was used as a biocide to control mildew in latex paints). EPA restricted this use under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), eliminating mercury in interior latex paints (55 FR 26754, June 29, 1990) and in exterior paints (56 FR 105, May 31, 1991).

populations or communities of important species.

First, because population viability was selected as an assessment endpoint, the benchmarks were developed from measures of reproductive/developmental success or, if unavailable, other effects that could conceivably impair population dynamics. In addition, the population-level benchmark was preferred over population-inference benchmarks. Population-level benchmarks are based on studies of effects on an entire population (*i.e.,* many interacting individuals) while population-inference benchmarks are based on studies of individuals with protection of the population being inferred from protection of the individual (*e.g.,* no observed adverse effect levels for individual organisms on reproductive endpoints). Although relatively few population-level benchmarks have been developed to date, these benchmarks are considered to be more rigorous than the point estimates gleaned from toxicity studies. Once the appropriate ecotoxicological studies were identified for mammals and/or birds, the CSCLs for each receptor were calculated for each medium of interest by scaling the toxicity benchmark from the test species to the receptor species, identifying the uptake/accumulation factors, identifying the exposures from dietary intake, and determining a risk-based concentration in each media. The benchmarks for the community receptors were taken from various sources such as the final chronic values developed for the National Ambient Water Quality Criteria. A detailed description of the benchmarks developed for all of the receptors evaluated is contained in the Technical Background Document for the risk assessment.

7. *Did EPA Conduct a Peer Review of The Risk Assessment?* The Agency has obtained a peer review from independent experts. Their comments have been received and are part of the peer review document that is in the docket for today's proposed rule. The peer review document also describes how the experts were identified and selected, contains information on the experts experience and employment, and provides a copy of the questions the peer reviewers were asked to address. Due to the time constraints for proposal of this rule, the Agency has not yet reviewed and addressed those comments. Both the peer review comments and the public comments will be addressed in the final rulemaking.

IV. Proposed Listing Determinations and Regulations

A. What Are The Proposed Regulations for Paint Production Wastes?

We are proposing that, if you generate any of the paint manufacturing wastes described in these listings, then you must determine whether or not your waste is a listed hazardous waste, or you must assume that it is hazardous. For the wastes identified in the K179 and K180 listings, your waste would become a listed hazardous waste if it contains any of the constituents of concern at a concentration equal to or greater than the hazardous concentration identified for that constituent. You would need to make a determination that all the constituents of concern in your waste are below the hazardous concentrations to have your wastes remain nonhazardous. Waste liquids listed in K180, however, would not be subject to the listing, if the wastes are stored or treated exclusively in tanks or containers prior to discharge to a POTW or under an NPDES permit. We are proposing the following regulatory language in § 261.32 for these wastes:

K179—Paint manufacturing waste solids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph (b)(6)(iii) of this section at a concentration equal to or greater than the hazardous level set for that constituent in paragraph (b)(6)(iii) of this section. Paint manufacturing waste solids are: (1) Waste solids generated from tank and equipment cleaning operations that use solvents, water and/or caustic; (2) emission control dusts or sludges; (3) wastewater treatment sludges; and (4) off-specification product. Waste solids derived from the management of K180 by paint manufacturers would also be subject to this listing. Waste liquids derived from the management of K179 by paint manufacturers are not covered by this listing, but such liquids are subject to the K180 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph (b) of this section.

K180—Paint manufacturing waste liquids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph (b)(6)(iii) of this section at a concentration equal to or greater than the hazardous level set for that constituent in paragraph (b)(6)(iii) of this section unless the wastes are stored or treated exclusively in tanks or containers prior to discharge to a POTW or under a NPDES permit. Paint manufacturing liquids are generated from tank and equipment cleaning operations that use solvents, water, and/or caustic. Waste liquids derived from the management of K179 by paint manufacturers would also be subject to this listing. Waste solids derived from the management of K180 by paint manufacturers are not covered by this listing, but such solids are subject to the K179 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph (b) of this section.

Due to the uncertainties in our assessment of the management of paint manufacturing waste liquids in surface impoundments, we are seriously considering an alternative proposal not to list paint manufacturing waste liquids. We describe this alternative and our reasoning for this option later in this notice (see Section IV.D).

Under the proposed listings shown above, paint manufacturing wastes with constituents of concern below the concentration limits at the time of generation would not be hazardous waste K179 or K180; such wastes would be nonhazardous from their point of generation, and would not be subject to any RCRA Subtitle C management requirements for generation, storage, transport, treatment, or disposal (including the land disposal restrictions). Similarly, liquid paint manufacturing wastes would also be nonhazardous if the waste is managed or treated exclusively in tanks or containers prior to discharge to a POTW or under an NPDES permit regardless of whether it contained any of the constituents of concern. However, if paint manufacturing wastes are hazardous waste due to another listing code or because they exhibit a hazardous waste characteristic under section 261.24, the wastes remain hazardous under these other regulations.

We are proposing that the constituents and the concentrations in the two above listings (which would be specified in paragraph (b)(6)(iii) of § 261.32) would be those shown in Tables IV.A–1 for waste solids (K179) and in Table IV.A–2 for waste liquids (K180). These are waste concentrations that represent risk-based concentrations for constituents we determined to be of potential concern in paint manufacturing wastes. The concentration-based listing levels for waste solids are based on the risk modeling for landfills, and the levels for waste liquids are based on the risk modeling for surface impoundments. We also evaluated potential air releases from treatment of waste liquids in tanks, but as described in Section IV.C, we did not find significant risks for this management scenario. Therefore, we are proposing not to include wastes managed exclusively in tanks within the scope of the listing for waste liquids. See Section IV.D for further discussion of our reasoning for structuring the listing for waste liquids in this way, and for other options we are considering.

As described in Section III.E, we developed risk-based concentrations for the larger set of constituents shown in Table III.E–4. In general, we relied on the modeling results to guide us in deciding which constituents would be most useful in defining these paint manufacturing wastes as listed hazardous wastes. We chose constituents for listing from the list in Table III.E.4 using a number of criteria.

- We dropped constituents from further concern if the risk-based levels for the waste exceeded or approached 100% (i.e., 1,000,000 mg/kg), because these constituents could not present significant risks in the paint manufacturing wastes we evaluated.
- We did not include constituents that are already regulated by the TC. As discussed in Section IV.G, we found that the regulatory TC levels (see 40 CFR 261.24) would likely be below the protective levels we calculated for these chemicals. Therefore, based on our analysis, the existing TC regulations adequately regulate risks from these constituents in these wastes, because wastes exhibiting the TC would have to be treated prior to disposal.
- We dropped constituents if their levels were so high that we believe it is highly unlikely that these chemicals would ever exist at such levels in waste solids from paint manufacturing.

For paint manufacturing waste solids (K179) we used the risk levels in Table III.E–4 calculated for emission control dust, because these were slightly lower than the levels for the combined solids. Using the above criteria for the 43 constituents listed in Table III.E–4, we dropped 24 constituents that have risk-based levels above 100% and 11 other constituents that are TC chemicals. We dropped three others that are unlikely to exist in paint wastes at the calculated risk-based levels. Two of the three have risk-based levels that are close to 100% and are therefore implausible for waste (n-butyl alcohol—970,000 mg/kg, formaldehyde—930,000 mg/kg). The other constituent, methylene chloride (dichloromethane), has a level of 24% (240,000 mg/kg). This appears unlikely, given that manufacturers have moved away from using chlorinated solvents in paints. This is further supported by the responses to the 3007 survey, which showed that the presence of this chemical was not reported by any facility in nonhazardous waste.

For waste liquids (K180), we used the risk-based levels in Table III.E–2 derived for wastewaters in surface impoundments. We dropped 14 constituents that have risk-based levels above 100% and 13 others that are TC constituents. We also dropped four other constituents that have levels that appear unlikely for waste liquids: ethylene glycol, phenol, methanol, and 2,4-dimethylphenol. The calculated levels for ethylene glycol (790,000 mg/L), phenol (270,000 mg/L) and methanol (200,000 mg/L) were so high that we considered these unlikely to ever occur in liquid paint manufacturing wastes. While all three are potentially used as water-soluble solvent ingredients, phenol and methanol are also used as biocides in water-based paints.[24] While the Survey showed these chemicals were found frequently in paint manufacturing wastes, no generator reported levels in nonhazardous or hazardous wastes that would approach the modeled levels of concern (the only waste with high levels was an off-spec paint containing 20% of ethylene glycol that was sent to fuel blending). For waste streams to approach these concentrations, the constituents would have to start out at even higher concentrations in the product. Such high levels in the products are unrealistic, because products with such high concentration of these constituents would not have the attributes of paint. Therefore, we are not proposing to include these chemicals as constituents in the paint listings.[25]

We dropped 2,4-dimethylphenol as a constituent of concern for waste liquids because the 3007 Survey showed that facilities did not report its presence in nonhazardous waste. Furthermore, the only potential use in paint we found for this chemical was possibly as a biocide. Therefore the low concentrations resulting from such a use would be unlikely to approach the risk-based level (17,000 mg/L). We also note that the TRI data showed only minimal releases (5 lbs.) to off-site wastewater treatment for all facilities in SIC code 2851.

Regulations that limit air releases from off-site wastewater treatment facilities are also likely to keep levels of these organic constituents below such high levels. EPA is planning to propose a MACT standard for paint manufacturers (Miscellaneous Organic Chemical and Coatings Manufacturing) that would regulate HAPs in wastewaters, both when managed on-site and when sent off-site for treatment. Furthermore, subpart DD in 40 CFR part 63 sets National Emission Standards for Hazardous Air Pollutants (NESHAP) from off-site waste and recovery operations, which may include off-site centralized wastewater treatment facilities (July 1, 1996, 61 FR 34140).[26] In addressing potential air releases from such facilities, the CAA regulations are likely to prevent the levels of most chemicals at issue here (e.g., phenol and methanol) from reaching the risk-based levels under consideration in liquid paint manufacturing wastes. This is likely because such MACT standards often provide incentives to reduce HAPs through source reduction or pretreatment to avoid costly engineering controls.

We solicit comment on the proposed list of constituents and their levels. We seek comment and supporting information as to whether any other constituents discussed above should be added to the chemicals for listing paint solids or liquids and the basis for such action. We seek any information that may assist us in deciding whether any of the constituents or levels in Tables IV.A–1 and IV.A–2 are so unlikely to be present at the levels of concern that we should drop them from the listing. For example, the levels for the solids (K179) are high for methyl isobutyl ketone (73,000 mg/kg). The liquid level for formaldehyde (82,000 mg/L) is also unlikely for a chemical that has been used mainly as a biocide or in polymer binders. In addition, we question whether the chemicals methyl methacrylate and styrene, which are used primarily as resins rather than in their monomeric forms, would be present at the high levels shown in Tables IV.A–1 and IV.A–2 for the solid or liquid paint manufacturing wastes. However, we believe levels of the monomeric forms of acrylonitrile and acrylamide that are present in the resins may still present a potential risk at the relatively low levels set for waste solids and waste liquids not managed in tanks. Therefore, we are proposing to include acrylonitrile and acrylamide as listing constituents, because they may be in paint manufacturing wastes at or above these levels (see discussion in Section IV.C on potential risks from tanks). Depending on comments, we may choose to add or remove constituents from the concentration-based listing.

[24] We found solvent uses for phenol were limited in a listing determination for solvent uses of this chemical (see 61 FR 42318, August 14, 1996). Primary uses as a solvent were in the petroleum industry (extraction of lube oil) and in microelectronic and automotive industries (removing coatings). While this previous analysis did not focus on uses as ingredient, which is the potential use in paint formulations, this indicates that the use of phenol for its solvent properties is relatively rare.

[25] The proposed levels are based on the probabilistic risk results for the 90th percentile. If we were to use the results for the 95th percentile, we would consider including methanol, because then the listing level for liquid wastes would drop to 6.2%, which we believe is somewhat more likely.

[26] EPA concluded that this group of wastewater treatment plants would likely include some facilities that would be major sources of HAPs (see 61 FR 34144/2). Thus, these major sources would be subject to the MACT standard.

As required under § 261.30(b), we are proposing to add the constituents that are the basis for the listings to Appendix VII of Part 261. We are proposing to add the constituents in Table IV.A–1 for K179 and the constituents in Table IV.A–2 for K180. In addition, a number of constituents in Tables IV.A–1 and IV.A–2 are not currently listed in Appendix VIII to Part 261 as ''hazardous constituents.'' EPA places constituents on Appendix VIII if scientific studies show the chemicals have toxic, carcinogenic, mutagenic, or teratogenic effects on humans or other life forms (see § 261.11(a)(3)). The Risk Assessment Background Document contains the detailed toxicological data for all constituents we evaluated, including the chemicals we are proposing to add to Appendix VIII: n-butyl alcohol, ethyl benzene, methyl isobutyl ketone, styrene, and xylene. If we choose the alternative of not listing paint manufacturing waste liquids (K180), then we would not need to add the constituents to Appendix VII for K180, and we would need to add only methyl isobutyl ketone to Appendix VIII.

TABLE IV.A–1.—CONCENTRATION LEVELS FOR WASTE SOLIDS (K179)

Constituent	Concentration levels (mg/kg)
Acrylamide	310
Acrylonitrile	43
Antimony	2,300
Methyl Isobutyl Ketone	73,000
Methyl methacrylate	28,000

TABLE IV.A–2.—CONCENTRATION LEVELS FOR WASTE LIQUIDS (K180)

Constituent	Concentration levels (mg/L)
Acrylamide	12
Acrylonitrile	9.3
Antimony	390
Ethylbenzene	11,000
Formaldehyde	82,000
Methyl Isobutyl Ketone	340
Methyl Methacrylate	2,100
Methylene Chloride	4,500
N-Butyl Alcohol	41,000
Styrene	4,600
Toluene	1,200
Xylene (mixed isomers)	3,900

The listing levels we are proposing for K179 and K180 are different for the waste solids and waste liquids. These levels are based on the risk assessment for various scenarios for disposal of solids (landfill) and the liquids (surface impoundment). In general, we believe generators will be able to readily determine which waste category their wastes would be in, based on their responses to the 3007 Survey, and their reported management practices. However, we are considering setting a clear definition to distinguish the waste solids and liquids, such that a generator can readily determine which listing applies. Thus, we request comment on several options in establishing a clear definition that would distinguish solids vs. liquids.

Perhaps the most straightforward approach would be to set a level of percent solids above which the waste would be a solid paint manufacturing waste and below which it would be a liquid paint manufacturing waste. One possible level could be 15%. Thus, this option would define paint manufacturing waste solids as those containing 15% or above solids (by weight). This cutoff reflects the general approach we used in our modeling for solids. In our assessment of releases from landfills we assumed that the waste contained a maximum moisture level of 85% (for sludges; we assumed a maximum moisture level of 15% for dusts). Furthermore, because of the restrictions on free liquids in municipal nonhazardous landfills (e.g., see § 258.28), we do not envision wastes containing less than 15% solids could reasonably be managed in a landfill. Therefore, we believe that wastes containing less than 15% solids will be managed in units associated with wastewater treatment, such as tanks or surface impoundments. In addition, in most cases water will be separated from solids as part of routine wastewater treatment. Thus, generators would be evaluating solid residues, which clearly meet our solid definition, or treated water, which would typically be discharged to a POTW or under an NPDES permit, and would not be covered by the K180 listing in any case.

Percent solids could be measured by an established method, such as the method for total suspended solids (TSS) described in EPA guidelines for test methods used under the CWA (EPA method 160.1 in 40 CFR 136.3, Table 1B).[27] However, generators may have the knowledge necessary to decide whether their paint manufacturing waste was a liquid or a solid, based on past analysis or disposal practices. We believe that in many cases, especially for wastes that are clearly ''wet'' or ''dry,'' the generator can easily tell from a visual inspection that solids content is well above or below 15%. Thus, if we were to set a level to define paint manufacturing waste solids and liquids, we believe we could allow the generator to use his knowledge, rather than necessarily requiring a test.

Instead of setting a specific level of percent solids, another option is to use the Paint Liquids Filter Test (method 9095 in SW–846) to determine if the waste is a liquid or a solid. A paint manufacturing waste found to contain free liquid under this method would be considered a liquid, and would be evaluated under the K180 listing, while a paint manufacturing waste that does not contain free liquids would be subject to the K179 listing. This method appears logical because it is presently used in defining the term ''liquid waste'' in the solid waste disposal criteria for determining compliance with the prohibition on disposing of bulk or containerized liquid in municipal landfills (§ 258.28). Method 9095 is also used in a similar way for hazardous waste landfills (§ 264.313(c)). Thus, using this method to distinguish paint manufacturing waste solids from liquids would be consistent with the definitions used in the operating practices for the management scenario modeled for solids, i.e., landfills.

A third option would be to use a definition of liquids that is analogous to the definition of wastewater used under the land disposal restrictions. Wastewater is defined as waste with less than 1% total suspended solids (TSS) and less than 1% total organic carbon (§ 268.2(f)); nonwastewater is defined as any waste that is not wastewater. While using this approach would allow some consistency in definitions in the listings and the LDR programs, we believe this would not be appropriate. A key disadvantage of this approach is that it defines wastes with greater than 1% TSS as a nonwastewater, i.e., a solid, even though such a waste is highly likely to be managed in wastewater treatment systems using tanks and surface impoundments, and not landfills. Given this problem, we do not think using this definition would be useful to define wastes solids and liquids for purposes of the paint listings.

We seek comment on the need for specific definitions for paint manufacturing waste liquids and solids, and the relative merits of the above options or similar approaches. We also request comment on whether facilities are likely to have information available on the percent solids in their wastes.

[27] Another option would be to use section 7.1 in the TCLP (method 1311) to measure filterable solids.

B. Why Are We Proposing to Use the Level of Constituents in the Waste Solids as Total Waste Concentrations Rather Than Leachate Concentrations?

We are proposing to set the concentration levels for defining hazardous paint solids using the concentrations measured in the waste itself, i.e., the totals concentration.[28] We considered using the landfill leachate levels instead of the waste levels to define the listed waste. Using landfill leachate levels would require generators to evaluate their wastes using a test such as the Toxicity Characteristic Leaching Procedure (TCLP).[29] However, we decided not to use the TCLP approach for a number of reasons. We believe that the partitioning model used to establish the totals concentrations is a more appropriate tool to assess risks posed by the paint manufacturing wastes. This is because the partitioning model factors in periodic placement of the specific waste volumes in cells within the landfill, closure of the landfill after 30 years, volatilization of constituents from the landfill through partitioning to the air, and any degradation of organics while in the unit. The leaching values for the paint manufacturing waste solids result from the partitioning of constituents from the waste to water infiltrating the unit. A test method like the TCLP does not reflect these factors. The TCLP approach is designed only to assess groundwater impacts, and does not account for other releases or processes occurring in landfills. Therefore, the estimated leaching numbers derived from our modeling assessment of paint manufacturing wastes, where partitioning and degradation are occurring before the constituents leave the unit, are not strictly comparable with the simple leaching of constituents from wastes represented by the TCLP.

We recognize that the totals levels appear somewhat high in comparison to the leachable levels we calculated for our assessment of paint manufacturing wastes (Table IV.–3). For example, the leaching level calculated for dichloromethane is 390 mg/L, compared to a total level of 240,000 mg/kg. However, it is not surprising that leachate levels derived from the waste would be lower than the levels in the waste itself. Most of the organic constituents assessed are relatively volatile, and will begin to volatilize as they are placed in the landfill. The entire mass of constituent in the waste is not placed in the landfill at once, but rather is placed in cells over the life of the unit. Therefore, as disposal occurs, the waste constituents are continuing to partition into air, soil, or leachate. Our model also factors in degradation of organics in the landfill. Such biodegradation is relatively slow for most chemicals, however this also assists in attenuating the levels of constituents that are released to the subsurface. We recently published related modeling results as part of the Hazardous Waste Identification Rule (HWIR) using the same modeling approach (64 FR 63382, November 19, 1999, and 65 FR 44491, July 20, 2000), though this effort covered a wider distribution of waste volumes. The use of totals rather than leachate for a concentration-based listing is also consistent with another recent EPA proposal for listing hazardous waste from the Dye and Pigments industry (64 FR 40192, July 23, 1999).

Therefore, we are proposing the concentration levels for the waste itself for the listing for waste solids from paint manufacturing. However, we seek comment on the option of setting the leachate concentrations from our modeling as the listing levels for the paint solids, and on the potential impacts (incremental costs and benefits) of such an approach. We may still consider a final regulation based on the measurement of leachate with the TCLP method, as shown in Table IV.B–3, after further consideration and review of comments.

TABLE IV.B–3.—ALTERNATIVE CONCENTRATION LEACHING LEVELS FOR WASTE SOLIDS (K179)

Constituent	Concentration levels (mg/L)
Acrylamide	0.70
Acrylonitrile	0.91
Antimony	58
Methyl Isobutyl Ketone	42
Methyl methacrylate	160

C. Why Are We Proposing to Exclude Waste Liquids Managed in Tanks?

We are proposing that liquid paint manufacturing wastes stored or treated exclusively in tanks or containers prior to discharge to a POTW or under an NPDES permit not be subject to today's proposed listing because these wastes managed in tanks do not pose sufficient risk to warrant hazardous waste regulation.

As shown in Table III.D–4, nearly all of the liquid paint manufacturing wastes are managed in some type of wastewater treatment system (small volumes are sent to fuel blending or other treatment). Furthermore, as indicated in Table III.D–4, liquid wastes are primarily classified as water or caustic cleaning liquids, except for one small volume of solvent cleaning liquid that went to a fuel blender.

For on-site tanks, as described in Section III.E, we conducted a bounding risk analysis for on-site treatment tanks that evaluated the worst case scenario for on-site management in tanks, including storage as well as treatment tanks. Our analysis identified some potential constituents of concern: Benzene, chloroform, mercury, methylene chloride, tetrachloroethylene, and acrylonitrile. However, when the survey responses provided data on constituent levels, these data indicated that these constituents are unlikely to be present in these wastes at levels of concern. In addition, for benzene, chloroform, mercury, and tetrachloroethylene, the risk-based concentrations derived from the bounding risk analysis are significantly higher than the respective TC levels; therefore, the TC regulations provide some control for most of these constituents. For acrylonitrile, the calculated risk-based concentration of 1,500 ppm is significantly higher than the projected range of concentration of 1–40 ppm for acrylonitrile in liquid waste streams; as such, it is not of concern. Most other constituents of concern either bounded out (*i.e.,* modeled levels were higher than 1,000,000 ppm), or were unrealistically high for paint manufacturing wastes. The risk-based levels derived from the risk assessment for methylene chloride, methyl isobutyl ketone, toluene, vinyl acetate, and xylene are so high that we believe they are highly unlikely to exist at such levels in nonhazardous liquid paint manufacturing wastes. This evaluation for on-site tanks is discussed in more detail in the following section (IV.C.1).

For off-site treatment tanks, we conducted a probabilistic risk assessment as described in Section III.E. This risk assessment identified three potential constituents of concern: Mercury, benzene and acrylonitrile. The survey responses showed that these constituents are not likely to be present in the wastes at concentrations of concern. In addition, the levels of mercury and benzene in the waste are also limited by the existing TC regulations, *i.e.,* the risk-based levels derived from the risk assessment are

[28] This is not an issue for the listing for paint liquid wastes, because any analysis of the liquids would include an analysis of the total liquid mixture.

[29] See method 1311 in OSW's methods manual, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW–846.

well above the TC levels. As described below, we determined that acrylonitrile is unlikely to exist in paint manufacturing waste liquids at the risk-based levels of 69,000 ppm. Therefore, there is no need to regulate paint manufacturing waste streams managed in off-site treatment tanks. See section IV.C.2 for a full discussion.

1. On-Site Storage and Treatment Tanks

Based on our extrapolated survey results, we estimate that 14,564 metric tons (approximately 47%) of nonhazardous liquid paint manufacturing wastes generated are managed in on-site storage tanks and 7,514 metric tons, or approximately 24%, of nonhazardous paint manufacturing waste liquids are managed in on-site treatment tanks. After these wastes are managed on-site in storage and treatment tanks, the wastes are then either directly discharged into a waterway under a NPDES permit, discharged into a POTW, or sent to centralized wastewater treatment facilities.

For tanks, we normally model air emissions. We assume that significant groundwater risks are unlikely because tanks do not leak liquids into the soil if properly maintained. Treatment tanks represent a more conservative scenario for modeling purposes because they are typically used for the aeration and flocculation of liquid wastes to settle out solids, causing more constituents to escape into the air than the relatively quiescent accumulation of liquids in storage tanks. Accordingly, we evaluated the potential risks from the management of liquids in treatment tanks to cover both scenarios.

As described earlier in Section III.E, we conducted a bounding analysis of the potential air releases from the nonhazardous liquid wastes treated in on-site treatment tanks. This conservative analysis assumed tanks are uncovered, and modeled the largest liquid residual volume and tank size reported by the surveyed facilities. The risk-based levels for most constituents exceeded 100%, and would not present significant risks in the paint manufacturing wastes for this scenario. The risk assessment results showed somewhat lower risk-based concentrations for paint manufacturing wastes in tanks for some constituents, *i.e.,* benzene (1,100 ppm), chloroform (15,000 ppm), mercury (41 ppm), tetrachloroethylene (22,000 ppm), acrylonitrile (1,500 ppm), methylene chloride (17,000 ppm), methyl isobutyl ketone (780,000 ppm), toluene (120,000 ppm), vinyl acetate (100,000 ppm), and xylene (830,000 ppm); we discuss these chemicals in detail below.

In general we do not expect significant levels of organic chemicals in on-site wastewater treatment systems for several reasons. First, the liquid wastes most likely to have high organic content, solvent cleaning wastes, are managed as hazardous. Except for one facility, these wastes were coded as hazardous waste, either due to a F-listing or because of a characteristic. The 3007 survey showed that all the generators of hazardous waste liquids reported the wastes were treated by incineration, fuel blending, or they were reused. Therefore, we have no data suggesting facilities are treating such high organic liquids in on-site wastewater treatment systems.

Second, the 3007 survey shows that none of the small number of facilities that treated wastes in on-site wastewater treatment (WWT) tanks (8 facilities, representing about 18 facilities in our weighted sample) reported significant organic content in their wastes. Of the 8 facilities, only one reported the presence of any organic constituents of potential concern, but listed them only because they may occasionally be present in the waste. Of the other 7 facilities, most reported the presence of metals, a few reported vinyl acetate polymers, and one reported the water-soluble ethylene glycol.

Finally, as noted in Section IV.A above, a MACT standard covering paint manufacturers will soon be proposed that will address potential air releases from these facilities. The MACT would place limits on HAPs in wastewater treatment systems, and would likely keep organic levels in paint manufacturing wastewaters relatively low.

Turning to the constituents of possible concern (benzene, chloroform, mercury, methylene chloride, tetrachloroethylene, and acrylonitrile), the facilities reported in their survey responses that these chemicals were either not present at all, or were present at only trace concentrations. Out of the 187 paint manufacturers surveyed, the responses showed benzene was present in trace amounts in only one facility's nonhazardous water cleaning liquid; mercury was present in only two facilities' nonhazardous water cleaning liquid at trace levels (up to 0.06 ppm). No facility reported the presence of any chloroform, methylene chloride, or tetrachloroethylene in any liquid residual. We discuss the possible presence of acrylonitrile in detail below. Furthermore, the risk-based levels for most of these constituents are well above their TC levels (benzene-0.50 ppm, chloroform-5.0 ppm, mercury-0.2 ppm, and tetrachloroethylene-0.7 ppm). Consequently, we are not proposing regulating these constituents under today's proposed listing.

Acrylonitrile is a monomer, *i.e.,* a relatively small compound with low molecular weight. It reacts with other monomers to form polymers (*i.e.,* cross-link into large, high molecular weight compounds) that are used as paint binders. However, the reaction is rarely 100% complete, and small amounts of the individual monomers remain unreacted as impurities in the polymer. Unreacted acrylonitrile monomers, not their polymers, are the targeted constituents of concern in our risk assessment.

With respect to acrylonitrile monomers, we do not expect this constituent to be present in paint manufacturing wastewaters above the risk-based concentrations derived from the bounding analysis for tanks. To analyze whether concentration levels of acrylonitrile at 1,500 ppm are reasonable as a basis for listing liquids in on-site tanks, we developed a methodology to determine whether these constituents are likely to occur in paint manufacturing waste liquids at concentrations within the range of the risk-based levels. We assessed potential concentrations of acrylonitrile in paint manufacturing liquid waste streams in a three-step process that involved tracking the monomers from point of origin (binder) to the final destination (liquid waste streams): (1) We estimated the concentration range of acrylonitrile monomers in the binder systems used to make paint; (2) we estimated the volume percentage of the binder systems added into paints themselves; and, (3) we estimated the monomer concentration range in paints in tank cleaning wastes. Based on these calculations (which are discussed in more detail below), we estimated that the ranges of acrylonitrile monomer concentrations in the liquid waste streams should be one to 40 ppm. We then compared these projected concentration ranges of acrylonitrile in the liquid waste streams to the risk-based levels calculated in the risk assessment.

As specified above, we estimated the likely range of unreacted monomer of acrylonitrile in the binders (*i.e.,* polymers) to be between 20 ppm and 1,000 ppm. This is reflected in our analysis of the use of acrylamide and acrylonitrile polymers in paint formulations [30] and the Material Safety

[30] See the memo from Paul Danault, Dynamac Corporation, to David Carver and Cate Jenkins, EPA,

Data Sheet (MSDS) data we obtained from some paint manufacturers (copies available in the public docket for today's proposed rule), which show the monomer mixture in binders in the 500 to 1,000 ppm range. Second, we projected that the likely concentration ranges of monomers in a paint or coating are approximately 10 ppm to 500 ppm for acrylonitrile. This estimate was based on our examination of paint formulations, which indicates that these paint formulations contain up to 50% by weight of acrylonitrile-acrylic polymer.[31] Finally, we estimated the projected monomer concentration in the resulting water cleaning liquids is approximately one ppm to 40 ppm for acrylonitrile given that approximately 50 gallons of water are needed to wash a typical paint mixing tank of approximately 5 feet in diameter and 8 feet in height with a paint depth of 6 feet,[32] and that a 0.0625-inch film of paint is attached to the inside surface of the tank up to 6 feet (amounting to a total of 4 gallons of paint to be rinsed). These projected acrylonitrile concentrations in paint manufacturing wastewaters are significantly lower than the calculated risk-based concentration of 1,500 ppm. For more details, see ''Potential Acrylonitrile Concentrations in Paint Manufacturing Liquid Waste Streams' in the public docket for today's proposed rule. Therefore, we believe it is highly unlikely for this constituent to be present in paint manufacturing liquid waste streams at such levels.

In addition, according to the information available to us, acrylonitrile is not widely used in the U.S. paint manufacturing industry, and its use is diminishing. For example, resin manufacturers are marketing ''acrylonitrile free'' resins. It is also a practice within the resin manufacturing industry to remove residual monomer before selling the polymer for paint production.

The low use of this binder in paints is supported by our survey data. Six of 187 surveyed paint manufacturing facilities reported acrylonitrile-derived polymers in their nonhazardous liquid residuals (in particular nonhazardous water cleaning liquids). In addition, one survey response indicated the presence of acrylonitrile and acrylonitrile-derived polymers in the nonhazardous water cleaning liquids at 2.8%. Assuming the polymers used by this facility include the monomers in concentrations ranging from 20 ppm to ×1,000 ppm for acrylonitrile as estimated above, the maximum monomer concentration in this facility's nonhazardous wash water would be less than 28 ppm (i.e., 2.83% x 1,000 ppm/acrylonitrile monomer in polymer), which is consistent with our assessment (i.e., between <1 ppm to 40 ppm).

The risk-based levels derived from the risk assessment for methyl isobutyl ketone (780,000 ppm, or 78%), toluene (120,000 ppm, or 12%), vinyl acetate (100,000 ppm, or 10%), and xylene (830,000 ppm, or 83%) are so high that we believe they are highly unlikely to exist at such levels in nonhazardous liquid paint manufacturing wastes. This is reflected in the responses to our Section 3007 survey, which indicated that the highest levels of toluene, vinyl acetate and vinyl acetate-derived polymers, and xylene in nonhazardous liquid residuals were 0.025 ppm, 16,000 ppm, and 118 ppm, respectively.

In conclusion, our analysis indicates there are no significant risks posed by the modeled constituents in nonhazardous paint manufacturing wastes that are managed in on-site storage and treatment tanks. We believe the likely levels of the potential constituents of concern in paint manufacturing wastewaters are substantially lower than the risk-based concentrations derived from the bounding risk analysis. Therefore, requiring the facilities to analyze or otherwise evaluate these constituents would impose an unnecessary burden on paint manufacturers. Thus, we are proposing that paint manufacturing waste liquids stored and/or treated in on-site tanks at paint manufacturing facilities are not subject to today's proposed listing.

2. Management of Liquid Paint Manufacturing Wastes in Off-Site Treatment Tanks

Based on our extrapolated survey results, we estimate that 6,407 metric tons (approximately 21%) of liquid nonhazardous paint manufacturing wastes generated are disposed off-site in privately owned wastewater treatment facilities where tanks and surface impoundments may be used as part of the treatment process. Following treatment, the wastes are typically discharged into surface waters under an NPDES permit, or discharged to the POTW system.

As described earlier in Section III.E, the risk assessment conducted for liquid paint manufacturing wastes managed in off-site treatment tanks identified potential inhalation risks associated with only a few constituents. The risk assessment estimated risk-based concentrations for mercury (10,000 ppm), benzene (190,000 ppm) and acrylonitrile (69,000 ppm).

As discussed above, the survey showed that facilities reported only traces of benzene or mercury in a few nonhazardous liquid residuals. Furthermore, levels of both constituents are controlled by the existing TC regulations. Therefore, there is no need to regulate these TC constituents further under today's proposed listing.

For acrylonitrile, the risk-based concentration of 69,000 ppm is significantly higher than the estimated range of acrylonitrile monomer in paint manufacturing wastewaters (see previous discussions on liquid wastes managed in on-site storage and treatment tanks). Therefore, it is highly unlikely for this constituent to be present in paint manufacturing liquid waste streams at such a high level.

We note that 21 of the 187 surveyed paint manufacturing facilities reported that they sent nonhazardous liquid wastes to off-site wastewater treatment facilities, of which only one reported having any of the three constituents of concern in the wastewater. Specifically, this facility sent a very small quantity of nonhazardous wash water (151 gallons/year) containing an unknown amount of acrylonitrile to a centralized wastewater treatment facility.

In conclusion, we believe there are no significant risks posed by the modeled constituents in nonhazardous paint manufacturing wastes that are managed in off-site treatment tanks. We believe the levels of the potential constituents of concern in paint manufacturing wastewaters are substantially lower than the risk-based concentrations derived from the risk assessment. Therefore, requiring the facilities to analyze or otherwise report these constituents would impose an unnecessary burden on paint manufacturers. In addition, the levels of some constituents are controlled by the existing TC regulations. Furthermore, as noted previously, EPA has recently proposed a NESHAP for miscellaneous paints and coating manufacturing operations that would regulate wastewaters, both on-site and if sent off-site for treatment.[33]

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dated September 6, 2000, which is in the docket for today's proposed rule.

[31] *Ibid.*

[32] That is, 50 gallons of water used for washing per about 800 gallons of paint produced in the tank. This is a conservative assumption compared to the information in Reference 7 of the Bibliography, Development Document for Effluent Limitations Guidelines and Standards for the Paint Formulating Point Source Category, EPA 440/1–79/049B, which states that the median wastewater generation at waterbone paint facilities is 0.2 gallons per gallon of paint produced.

[33] As discussed previously, some off-site nonhazardous wastewater treatment facilities may also be covered by the NESHAP/MACT standards

Continued

Thus, we are proposing paint manufacturing waste liquids treated in off-site treatment tanks are not subject to today's proposed listing.

D. Why Are We Proposing a Contingent Management Listing for Liquid Paint Manufacturing Wastes, and What Other Options Are We Considering?

We are considering various options for the listing for paint manufacturing waste liquid (K180). Under the listing proposed for K180, the wastes would not be listed if they are managed in on-site storage and treatment tanks or containers prior to discharge to a POTW or under a NPDES permit. (Of course, if the concentrations of the listing constituents are below the regulatory levels, the waste would not be hazardous in any case.) We are proposing this type of ''contingent management'' listing because we did not find significant risk from treatment or storage in tanks, as noted above. However, if a paint manufacturing waste generator intends to send the waste off-site for treatment outside of tanks (and waste constituents are not below the listing levels), the waste would be K180 and would be subject to storage requirements under Subtitle C. We recognize that the regulation of the onsite storage and treatment of the waste in tanks prior to the waste being shipped offsite may be unwarranted because our risk analysis for tanks shows no significant risk for liquid paint manufacturing waste. Therefore, we are soliciting comment on the option of exempting wastes stored or treated on-site in tanks or containers from being a hazardous waste while it is stored on-site, regardless of what the ultimate treatment or disposal practice might be. This would mean that the point of generation for K180 would be when the waste is sent off-site, and that it would not be classified as K180 hazardous waste while it is stored or treated in tanks or containers on-site prior to shipment off-site for disposal.

The constituent levels we are proposing are based on the possible risks from management of the liquid wastes in an off-site centralized wastewater treatment system with an unlined surface impoundment. We did not complete a risk assessment for possible risks for various other known or potential management practices. Given that we found risk in one management scenario, but did not assess risks from other major practices, we are limiting the exemption from the listing to the management practice that we determined posed no significant risk, i.e., management in tanks. Therefore, we are proposing to list the paint manufacturing waste liquids, unless they are managed in tanks prior to discharge under an NPDES permit or to a POTW.

As discussed in Section II.G, the 3007 Survey showed that 21 paint manufacturers reported sending their liquid wastes to 24 off-site wastewater treatment facilities. We contacted 9 of these 24 and found one treatment facility that reported using a lined surface impoundment to treat two different paint manufacturers' liquid wastes. Based on the weighting factors used for our survey sample, we estimate these 24 off-site wastewater treatment facilities represent about 40 facilities in the U.S. that may accept paint liquids. While we cannot extrapolate the information from nine wastewater treatment facilities to the overall population, we estimate that there could be 4 to 5 treatment facilities that use impoundments of some kind. The one facility with an impoundment indicated the unit was lined, however there are no Federal regulatory requirements that ensure this would be the case for other impoundments throughout the country. Hence, it may be reasonable to assume that some of these impoundments may be unlined for modeling purposes. We note that surface impoundments are used to treat wastewaters in general, and that a recent study confirmed that a significant portion of impoundments in some industries are unlined.[34] (However, this study focused primarily on on-site impoundments used in specific industries, and not commercial off-site treatment facilities). Therefore, if we assume management of liquid wastes in an unlined impoundment is a plausible management scenario, our assessment suggests that the risks from such management may present a significant potential hazard to human health and the environment for some constituents of concern.

However, we are also seriously considering not listing paint manufacturing waste liquids, or using a different approach for a listing, due to the uncertainty in management practices we assumed in our risk assessment. While we are proposing to list because of potential risks arising from unlined surface impoundments, we are considering the alternative of not listing this waste because this may not be a ''plausible'' management scenario. As noted above, while the survey data shows that management in an off-site treatment facility is relatively common, we found only one case where a surface impoundment was in use. We estimate that only 4 to 5 such impoundments may be receiving any of the paint manufacturing waste liquids from the estimated 972 paint manufacturers. Thus, management of these wastes in surface impoundments appears to be an infrequent occurrence. The number of unlined impoundments receiving this waste is more uncertain due to our limited data on surface impoundments, but the probability of off-site commercial treatment facilities treating paint manufacturing wastes in such unlined units is likely to be even lower than the number of facilities using impoundments.

The effectiveness of liner systems depends, in part, on how they are designed. Composite and double liners that combine two or more layers of liner material with leachate collection and leak detection should minimize leakage to the subsurface during the period when the leachate collection system is actively managed. While it is difficult to predict the level of protection afforded by a liner system due to the uncertainty concerning long-term performance, we believe the level of protection could be significant for a surface impoundment, which will contain liquid wastes only during its operating life.[35] Therefore, our assessment of an unlined surface impoundment may overestimate potential risks from this disposal scenario.

The risk results from modeling surface impoundments may also overestimate risks for other reasons. As noted in Section III.E, we used impoundment data gathered in a 1985 Industrial D Screening Survey. We were not able to distinguish off-site vs. on-site impoundments from these data, so we used a sample from all units in the database. Because most impoundments

in 40 CFR part 63 (61 FR 34140, July 1, 1996), if they are a major source of hazardous air pollutant (HAPs) emissions defined in section 112 of the CAA amendments of 1990, and if the wastes they receive from off-site contain one or more HAPs.

[34] Based on an initial review of data from the Study of Industrial Non-hazardous Waste Surface Impoundments required under the Land Disposal Program Flexibility Act. Also, in a 1995 EPA found only 26 States had requirements for liners under State regulations: see State Requirement for Industrial Non-Hazardous Waste Management Facilities, U.S. Environmental Protection Agency, October 1995.

[35] We believe there is greater uncertainty about the efficacy of liners in providing long-term protection from releases from landfills, because the wastes remain indefinitely. A synthetically lined impoundment with a finite operational life of perhaps 30 to 50 years is less likely to release wastewater during the life of the unit. During operation, leaks in the liner system would be detected and presumably fixed; active use of an impoundment can be stopped, drained, and liners repaired. Also, the leachate collection system is likely to prevent a significant release during operation.

are part of on-site treatment processes for industrial process wastewater, the data include a variety of types of units that may not be realistic for the off-site commercial wastewater treatment facilities we are attempting to model. Our database contains units with characteristics that are unlikely for large off-site treatment facilities, i.e., many units are relatively small (median area about 3,200 m^2) and have low flow rates with long retention times (median retention time about 0.5 years, 90th percentile retention of 50 years). These characteristics mean that many of the impoundments used in the modeling would have a fairly high fraction of paint manufacturing waste, e.g., the 90th percentile value for fraction of paint manufacturing waste in the unit was one. We believe that off-site commercial treatment units are more likely to be larger and have much shorter retention time, thereby reducing the average fraction of paint manufacturing waste in the treatment units. While it is difficult to gauge the importance of these characteristics in our risk assessment results, these may lead to an overestimate of impoundment risks. We may use this factor, in conjunction with a full review of all comments, as an additional reason not to list paint manufacturing waste liquids.

We solicit any information on the prevalence of surface impoundment management of paint manufacturing waste liquids, and any data related to the use of surface impoundments, either lined or unlined. After reviewing all comments and reconsidering all available information on the possible risks from management of paint manufacturing waste liquids, we may decide not to list this waste.

Assuming we decide to finalize a listing for paint manufacturing waste liquids due to the potential for risks from surface impoundments, we are also soliciting comments and supporting data on an alternative listing that would exclude other practices, such as incineration and fuel blending. We could limit the scope of the listing so that it would clearly apply only to wastes managed in surface impoundments. Thus, the listing could specify that it would apply only if the waste exceeded the regulatory concentration levels, and if the waste was managed in a surface impoundment. We may decide that such an approach is appropriate in this case given that this was the only practice modeled that presented unacceptable risk, and because the practice may be very infrequent. For the paint manufacturing wastes at issue in today's proposal, we did not find significant risks from management in tanks.[36]

The other reported management practices of potential concern were thermal treatment in incinerators, cement kilns, and fuel blending. As noted previously, in past listing determinations where we have attempted to assess risks from incineration, we found that the potential risks from the release of constituents through incineration would be at least several orders of magnitude below potential air risks from releases from tanks or impoundments (see listing determination for solvent wastes at 63 FR 64371, November 19, 1998). Although metal constituents would not be destroyed in thermal treatment, we expect the metal content of nonhazardous paint manufacturing waste liquids sent to incineration to be low; this is consistent with the 3007 Survey data, which show no nonhazardous paint manufacturing waste liquids with significant metal content. Limiting the listing to wastes only managed in impoundments would reduce the overall burden of the listing, so that it would apply only to the practice of most potential concern, i.e., surface impoundments.

E. Potential for Formation of Non-Aqueous Phase Liquids in Paint Manufacturing Wastes

We considered the possibility that some constituents in paint manufacturing wastes might form distinct nonaqueous phase liquids (NAPLs). NAPLs can be an issue, because once released to the subsurface a number of difficult problems may occur. Such problems include the creation of a long-term NAPL source in the subsurface and facilitated transport of contaminants that have an affinity for the NAPL fraction. The formation of NAPLs is strongly dependent on the specific wastes in question and the management practice, and it is difficult to predict when NAPLs might be important. However, many of the organic chemicals we evaluated for this listing are highly water soluble and in many cases volatile, thus most have little potential for NAPL formation. EPA has used a general approach in the Hazardous Waste Characteristics Scoping Study to identify which chemicals have some potential to form NAPLs based on water solubility and other parameters.[37] NAPL-forming chemicals generally have relatively low water solubilities (less than 5,000 mg/L) and are liquids at ambient temperature. Applying these criteria, the only non-TC constituents of concern that may potentially form NAPLs would be the phthalates and the aromatic hydrocarbons (ethylbenzene, styrene, toluene, and xylenes). Any NAPL-forming chemicals that are regulated under the TC (i.e., the slightly soluble chemicals benzene and tetrachloroethylene) are unlikely to form NAPLs in wastes, because the TC levels are well below their water solubility. Thus, wastes with TC constituents high enough to form NAPLs would be regulated as hazardous, and would not be land disposed until treated.

We believe that paint manufacturing wastes with the high organic content needed to form NAPLs are unlikely to be land disposed for several reasons. First, high organic wastes are typically sent for thermal treatment or recycling. For example, see the final listing determination for solvents (63 FR 64372, November 19, 1998); we found that solvent wastes with high organic content are usually thermally treated, and that wastes sent to landfills contained negligible amounts of solvent (63 FR 64384). Also, many landfills are unlikely to accept wastes with free liquids, and in fact such a practice is restricted under Federal regulations for municipal solid waste landfills (§ 258.28) and Subtitle C landfills (§ 264.314). Similar restrictions, while not federally mandated, are in place in most States for off-site nonmunicipal solid waste landfills.[38]

We believe that any paint manufacturing waste liquids that may be placed in impoundments or tanks at offsite wastewater treatment facilities are unlikely to contain significant NAPLs. The nonhazardous paint manufacturing waste liquids are nearly all reported to be from aqueous washing of equipment, with only one facility reporting generating a nonhazardous liquid from solvent cleaning; this facility sent this waste to a fuel blender.

[36] Discharges to surface waters are controlled under the CWA and require an NPDES permit, while discharges to a POTW are subject to State and national pretreatment standards. Note that 40 CFR 261.4 reflects the RCRA statute and excludes "any mixture of domestic sewage and other wastes that passes through a sewer system to a POTW for treatment" (40 CFR 261.4(a)(1)(ii)), and industrial wastewater discharges that are point source discharges subject to regulation under Section 402 of the CWA (40 CFR 261.4(a)(2)).

[37] U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Hazardous Waste Characteristic Scoping Study, November 1996, and U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Evaluation of the Likelihood of DNAPL Presence at NPL Sites, EPA 540–R–93–073, September 1993.

[38] U.S. Environmental Protection Agency, Office of Solid Waste, State Requirements for Industrial Non-Hazardous Waste Management Facilities, October 1995.

All other waste solvents were coded and managed as hazardous waste. This is not surprising, given that many solvents used for cleaning equipment would yield wastes that are listed as hazardous (F001 through F005), or exhibit a characteristic, such as ignitability.

The nonhazardous water cleaning liquids are mixed with other wastewaters when treated in offsite centralized wastewater treatment systems, making significant NAPLs less likely. As noted above in Section IV.A, existing and proposed regulations under the CAA would also tend to keep the organic content of wastewaters low for any chemical designated a hazardous air pollutant, or HAP. Nearly all constituents of potential concern we identified for paint manufacturing wastes are HAPs under the CAA. We believe that these rules make it unlikely that NAPLs would form in offsite wastewater surface impoundments.

The information in the 3007 Survey suggests that wastes with liquid or free solvents are not disposed in landfills. The waste data we collected from the 3007 Survey indicates that few of the nonhazardous paint manufacturing wastes of concern have the high organic content necessary to form a separate NAPL phase. Of the nearly 200 nonhazardous wastes reported (125 solids, 74 liquids), only 15 were reported to have levels of any organic constituent above relatively low levels (1%). In most of these 15 cases, the organic constituents included levels of associated polymers (polymers of acrylonitrile, styrene, and vinyl acetate). The few nonhazardous wastes with significant concentrations of a constituent that might form a NAPL (3 wastes reported to contain 2% or 6% butyl benzyl phthalate) went to incineration (one waste with 10% xylene went to unspecified offsite treatment). The remaining wastes with significant organic content contained ethylene glycol, which is highly unlikely to form NAPLs given its extreme solubility in water. In any case, only one waste with organic content above 1% was reported to go to a landfill (an off-specification paint manufacturing waste with 2.5% ethylene glycol). We recognize that the information for constituents in the 3007 Survey is limited, however, the data in hand show that generators do not appear to be sending paint manufacturing waste with high organic content to land disposal. Even in the event some generators were sending some wastes with higher potential NAPL-forming chemicals to land-based units, the volumes would be relatively small. This makes it unlikely that organic levels in these units would be sufficient to generate a NAPL phase that would impact releases to groundwater.

As noted previously in Section IV.A, EPA is planning to propose a MACT standard to address potential releases of volatile HAPs from paint manufacturing facilities. The proposed MACT would place limits on HAPs in wastewaters and keep organic levels in paint manufacturing waste relatively low.

As another check on the potential for NAPL formation in paint manufacturing wastes, we examined the Survey data for discarded off-specification paint. Our survey data indicated that disposal of off-spec products in landfills was fairly infrequent (13 facilities reported a total of 941 metric tons in 1998). From follow-up telephone calls to these generators, the facilities almost uniformly indicated that the off-specification material was not in liquid form; the wastes were in solid resins, hard cured by drying, or otherwise solidified prior to disposal.

F. Scope of the Listings and the Effect on Treatment Residuals

Today's proposal would result in two new hazardous waste listings that differ from previously promulgated listed hazardous wastes in that they include constituent-specific concentrations to define the scope of the listings. The primary purpose of these ''concentration-based listings'' is to establish levels at the point of generation of a waste, above which that waste is considered to be a listed hazardous waste (i.e., ''entrance'' levels). Wastes that are generated below these levels would not be subject to these listings.

We are also proposing to use the listing concentrations as ''exit'' levels for residues from paint manufacturing waste solids (K179). Residuals from the treatment, storage, or disposal of listed hazardous wastes are usually classified as hazardous wastes based on the ''derived-from'' rule (see 40 CFR 261.3(c)(2)(i)).[39] The use of the listing concentrations as exit levels for treatment residues would terminate the applicability of the derived-from rule and, therefore, the treatment residues would no longer be considered a listed hazardous waste. We are specifically proposing to add language to the standards in 40 CFR 261.3 to describe this self-implementing process for paint manufacturing waste solids (K179). For reasons discussed below, we are proposing that generators cannot use the listing levels for paint manufacturing waste liquids (K180) as exit levels, even if the waste falls below those levels through treatment. In the following discussion we also clarify further the status of liquids derived from paint manufacturing waste solids and vice-versa, and address mixtures or treatment residues that occur away from the paint manufacturing facility, such as at an off-site treatment facility.

We envision that the proposed listing of the paint manufacturing waste solids (K179) would function similarly to a hazardous waste characteristic such as toxicity, except that the concentration levels would be the basis for deciding a waste is hazardous only when applied to the solids as generated or managed at a paint manufacturing facility. Thus, a waste would become hazardous K179 only if it meets or exceeds the listing levels at the paint manufacturing facility. Structuring the listing for paint manufacturing waste solids in this way avoids implications for solids generated off-site from a *nonhazardous* waste that in part, or in whole, originated from a paint manufacturing facility. For example, we avoid small quantities of nonhazardous paint manufacturing waste liquids treated at an off-site commercial wastewater treatment facility subjecting any liquid or solid derived from them at an offsite treatment facility to evaluation against the levels proposed today for paint manufacturing wastes.[40]

We are proposing, however, that the paint manufacturing waste solids that are hazardous K179 may be treated to generate nonhazardous waste, if the treatment results in constituent concentrations that are below the listing levels in K179. Note that land disposal restrictions would still apply, as they do to ''decharacterized'' waste that was hazardous only due to a hazardous waste characteristic, until the waste meets the LDR treatment requirements (see Section VI of today's notice for the proposed standards). Thus, if treatment of K179 yields constituent levels that are below the listing levels and meet the appropriate LDR standards, the waste may be disposed as a nonhazardous waste (e.g., in a Subtitle D landfill). We are specifically proposing to add language to the standards in 40 CFR 261.3 to exempt solids that previously

[39] Also, the ''mixture'' rule (see 40 CFR 261.3(a)(2)(iii) and (iv)) provides that, with certain limited exceptions, any mixture of a listed hazardous waste and a solid waste is itself a RCRA hazardous waste. We are not proposing any changes to the mixture rule in today's action.

[40] Note that a paint manufacturing waste solid could be nonhazardous when generated, but become hazardous later if management on-site led to the waste becoming more concentrated and exceeding the listing levels. If this occurs at the paint manufacturing facility, it would become a listed K179 waste.

met the K179 listing, if the constituent levels are below the listing levels. We request comment as to whether the derived-from rule should apply to the K179 paint manufacturing wastes solids beyond the paint manufacturing site as they would in a traditional listing. However, we believe that our evaluation of the risks of disposal of solid K179 would apply equally well to solids that have been treated.

The proposed listing of paint manufacturing waste liquids (K180) operates like a characteristic only in the sense that if a paint manufacturing waste is below the listing level at the point of generation, it is not covered by this listing. However, it would act as a traditional listing if a paint manufacturing liquid waste generated at a paint manufacturing facility meets or exceeds the listing levels, in that liquids derived from K180 remain subject to the listing even if they fall below those levels through dilution or treatment. We are proposing that liquid residuals from K180 wastes would remain hazardous, because the surface impoundment scenario we used to set the listing concentrations for K180 assumed that the liquid paint wastes are mixed with other wastewaters in an off-site treatment facility. The listing levels we set for K180 are for the waste prior to any mixing and would necessarily be higher than the levels of the constituents that may exist in the off-site impoundment. We believe that the listing levels for K180 would not be appropriate for use in exiting the RCRA hazardous waste regulatory program, because they do not correspond to risk-based levels for the diluted waste in the impoundment.[41] Therefore, we are proposing that any liquid wastes derived from K180 would remain listed as K180 (unless the waste is excluded under the petition process set out in §§ 261.20 and 261.22, typically known as ‘‘delisting’’).

We are proposing that the scope of the listings reflect the practical situations that arise at the site of paint manufacturing if derived-from wastes are in a different form than the original paint waste, i.e., if liquid wastes are derived from K179, and if waste solids are derived from K180. In such cases, we believe that is more appropriate to evaluate these on-site derived-from wastes against the listing concentrations that reflect the corresponding waste form. Solids generated from K180 at the site of paint manufacturing would no longer be K180, but would be subject to classification as K179, if the waste meet or exceed the listing levels for K179. Under this approach, solids generated from K180 on-site that are below the listing levels for K179 would not be a hazardous paint waste. Similarly, a liquid waste derived from K179 at the site of paint manufacturing would be evaluated against the K180 listing conditions; if such a liquid is either managed exclusively in tanks or containers, or if the constituents in the liquid are below the listing levels for K180, the K179-derived liquid would not be hazardous paint waste. We have included text in the listing descriptions for K179 and K180 to establish these changes in waste codes for on-site derived-from wastes.

We are not proposing that the above change in waste codes would apply to waste residuals generated off-site. We believe that changes in waste codes would be confusing for off-site treatment facilities and may be difficult to track and enforce. Furthermore, K179 or K180 wastes that are sent off-site for treatment would likely be treated at a facility that accepts and treats a wide variety of hazardous wastes, and any derived-from wastes generated from treatment of K179 or K180 would likely carry multiple hazardous waste codes. Therefore, we are proposing to allow the mixture-derived from rules to operate normally off-site, except for the exemption for treated K179 noted previously. This approach still allows a treatment facility to use the exemption to the derived-from rule we are proposing for waste solids (K179); the treatment facility would have to treat only for the K179 hazardous constituents of concern (provided no new characteristics are imparted by the treatment process).

Finally, we stress that solids and liquids derived off-site from nonhazardous paint manufacturing liquids are not listed paint manufacturing wastes (i.e., not K179 or K180). Such wastes are not paint manufacturing wastes, in that the waste management facility is not directly involved in the manufacture of paint products. Therefore, these wastes would not be subject to the listing criteria for K179 or K180.

G. Relationships of the Proposed Listings to the TC

Fifteen constituents that we assessed for paint manufacturing waste are also constituents covered by the broadly-applicable Toxicity Characteristic (TC). We modeled these constituents, along with the constituents not covered by the TC, to see if for any reason the modeling approach would indicate a significant hazard would be posed that is not already addressed by the TC. This might have occurred, for example, if the windblown dust pathway had produced significantly lower concentrations. However, we found that, with one exception, the concentrations of concern predicted in the paint-waste modeling were above the levels already regulated by the TC.

For the fourteen constituents for which the paint modeling yielded concentrations higher than TC levels, we are not setting levels in this listing, and the TC will continue to apply. We are proposing to retain the more restrictive TC levels for these constituents to protect human health and the environment. The specific levels calculated for paint manufacturing waste for this proposal represent amounts of constituents that can be safely disposed for the relatively small volumes of paint manufacturing waste solids and liquids subject to today’s proposed listing. The TC levels, in contrast, broadly address all wastes in the country subject to RCRA Subtitle C. They were designed to protect human health and the environment from the possibility that many waste streams from multiple generators could be disposed of in a single landfill. Consequently, our TC risk assessments reflect much higher waste volumes arising from a broad spectrum of industries and sources. If we analyzed by itself any individual, small-volume waste stream subject to the TC, we might find that it did not pose risks at TC levels. However, a set of smaller waste streams from multiple sources could pose risks if disposed together with other wastes. Consequently, we believe we need to retain the broad, multiple-waste TC approach.[42]

For the remaining constituent, pentachlorophenol, the paint listing modeling results (at the 90th percentile probabilistic level) showed a protective leachable concentration of 66 mg/L. This is slightly lower than the existing TC level (100 mg/L). Upon review of 3007 survey data on prevalence, however, we found that this constituent is not currently used in paint production and it is not likely to be found in paint manufacturing wastes. While pentachlorophenol has apparently been used historically as a biocide in paint formulations, most

[41] Furthermore, wastes that are otherwise prohibited from land disposal may be treated in surface impoundments or series of impoundments that meet certain conditions (see section 268.4).

[42] This is consistent with current EPA regulations regarding ‘‘delisting petitions’’ under 40 CFR 260.22(c) and (d). If modeling indicates the waste does not pose a significant hazard, EPA exempts it from the hazardous waste listing. However, as required under the regulations, we do not exempt wastes that exhibit a hazardous waste characteristic.

pesticide uses of this chemical have been halted.[43] In addition, despite the fact that this is a TC constituent, this chemical was not reported in any of the wastes in the 3007 survey data. Given these facts we see no reason to include pentachlorophenol as a listing constituent for paint manufacturing wastes. The TC, of course, would continue to apply to any paint manufacturing waste containing pentachlorophenol, and wastes exceeding the TC level would be regulated as hazardous.

H. What Is the Status of Landfill Leachate From Previously Disposed Wastes?

Leachate derived from the treatment, storage, or disposal of listed hazardous wastes is classified as a hazardous waste by virtue of the ''derived-from'' rule in 40 CFR 261.3(c)(2). The Agency has been clear in the past that hazardous waste listings apply to wastes disposed of prior to the effective date of a listing, even if the landfill ceases disposal of the waste when the waste becomes hazardous. (See 53 FR 31147, August 17, 1988). We also have a well-established interpretation that listings apply to leachate derived from the disposal of listed hazardous wastes, including leachate derived from wastes meeting the listing descriptions that were disposed before the effective date of a listing. We are not reopening nor taking comment on any of these issues with this proposed rulemaking.

Of course, as set out in detail in the August 1988 notice, this does not mean that landfills holding wastes that are listed now as hazardous become subject to Subtitle C regulation. However, previously disposed wastes now meeting a listing description, including residues such as leachate that are derived from such wastes, and that are managed actively do become subject to Subtitle C regulation. See 53 FR at 31149, August 17, 1988. In many, indeed most, circumstances, active management of leachate would be exempt from Subtitle C regulation because the usual pattern of management is discharged either to POTWs via the sewer system, where leachate mixes with domestic sewage and is excluded from RCRA jurisdiction (see RCRA section 1004(27) and 40 CFR 261.4(a)(1)), or to navigable waters, also excluded from RCRA jurisdiction (see RCRA section 1004(27) and 40 CFR 261.4(a)(2)). In addition, management of leachate in wastewater treatment tanks prior to discharge under the CWA is exempt from RCRA regulation (40 CFR 264.1(g)(6)).

It is possible that waste solids within the proposed scope of K179 may have been disposed in landfills. Because we are proposing that liquids derived from the offsite management of K179 would continue to carry the K179 waste code, leachate from a landfill that accepted paint manufacturing waste solids might be classified as K179. While we do not believe that it is likely that liquid K180 wastes would have been disposed in landfills in significant quantities, a landfill may have accepted a derived-from K180 solid (as a result of offsite treatment). However, the proposed listings for the two paint manufacturing wastes are concentration-based listings, and it would be difficult to know whether the previously disposed wastes that meet the narrative description of K179 did in fact have constituent concentrations that would be at or above the K179 listing levels. We don't anticipate that records documenting the concentrations of proposed constituents of concern for these wastes exist for previously disposed wastes. Therefore, absent a finding that the disposed wastes would have met the listing being proposed today, it is unlikely that the previously disposed wastes would be classified as K179, and thus unlikely that landfill leachate and gas condensate derived from these wastes that are actively managed would be K179.

However, if actively managed landfill leachate and gas condensate derived from the newly-listed wastes proposed for listing in today's notice could be classified as K179, we would be concerned about the potential disruption in current leachate management that could occur, and the possibility of redundant regulation. This issue was raised to the Agency in the context of the petroleum refinery waste listings (see 63 FR 42173, August 6, 1998). A commenter expressed concern that, because some of the commenter's nonhazardous waste landfills received newly-listed petroleum wastes prior to the effective date of the listing decision, the leachate that is collected and managed from these landfills would be classified as hazardous. The commenter argued that this could lead to vastly increased treatment and disposal costs without necessarily any environmental benefit. After examining and seeking comment on this issue, we published a final rule that temporarily defers regulation of landfill leachate and gas condensate derived from certain listed petroleum refining wastes (K169–K172) that were disposed before, but not after, the new listings became effective, provided certain conditions are met. See 64 FR 6806, February 11, 1999. We proposed listing determinations for wastes from the dye and pigment industries (64 FR 40192, July 23, 1999) and from the inorganic chemical manufacturing industries (65 FR 55684, September 14, 2000) that propose deferrals for similar wastes derived from landfills. We also promulgated a listing determination for the chlorinated aliphatics industry (65 FR 67068, November 8, 2000) that retains the deferral.

At the time this issue was brought to the Agency's attention in the context of the petroleum refinery waste listings, EPA's Office of Water had recently proposed national effluent limitations guidelines and pretreatment standards for wastewater discharges—most notably, leachate—from certain types of landfills. See 63 FR 6426, February 6, 1998. In support of this proposal, EPA conducted a study of the volume and chemical composition of wastewaters generated by both subtitle C (hazardous waste) and Subtitle D (nonhazardous waste) landfills, including treatment technologies and management practices currently in use. Most pertinent to finalizing the temporary deferral for the petroleum refining wastes, EPA did not propose (or subsequently finalize) pretreatment standards for subtitle D landfill wastewaters sent to POTWs because the Agency's information indicated that such standards were not required (see 65 FR 3008, January 19, 2000).

The conditions included in the temporary deferral we published on February 11, 1999 are that the leachate is subject to regulation under the Clean Water Act, and the leachate cannot be stored in surface impoundments after a period of two years (February 13, 2001). See 40 CFR 261.4(b)(15). We believe that it was appropriate to temporarily defer the application of the new waste codes to such leachate in order to avoid disruption of ongoing leachate management activities while the Agency decides if any further integration is needed of the RCRA and CWA regulations consistent with RCRA section 1006(b)(1). We believe that it is still appropriate to defer regulation and avoid leachate management activities, and to permit the Agency to decide whether any further integration of the two programs is needed. As such, we would be concerned about forcing pretreatment of leachate even though pretreatment is neither required by the CWA, nor needed. Therefore, we are proposing to temporarily defer the regulation of landfill leachate and gas condensate derived from management of K179 and K180 wastes that we are

[43] See the cancellation for non-wood uses at 52 FR 2282, January 21, 1987.

proposing for listing in today's rule, with the same conditions as described in 40 CFR 261.4(b)(15) for petroleum wastes. We request comment on this proposed conditional deferral.

V. Proposed Generator Requirements for Implementation of Concentration-Based Listings

We are proposing that these concentration-based listings be self-implementing. This means that you (the waste generator) would be responsible for determining whether or not your wastes are K179 or K180 listed hazardous wastes at the point of generation based on the proposed procedures we describe below.[44] We are proposing a two-tiered implementation approach for the concentration-based listings, based on waste form (liquids or solids) and total annual quantity of the paint manufacturing wastes generated at each paint production facility, that you could use to determine whether your wastes are nonhazardous. Before using the proposed two-tiered approach, you would determine if any of your paint manufacturing waste solids or paint manufacturing waste liquids could contain any of the constituents of concern identified for these types of wastes (see Tables IV.A–1 and IV.A–2). We are proposing that you could use knowledge of your wastes (e.g., knowledge of the constituents in your wastes based on existing sampling and analysis data and/or information about raw materials used, production processes used, and degradation products formed) to make this initial determination regardless of the quantity of waste you generate. If any portion of your wastes at the point of generation will not contain any of the constituents of concern identified for your specific type of wastes, you would not have to use the two-tiered approach to determine whether those wastes are nonhazardous (i.e., are not K179 or K180 listed wastes). Paint manufacturing wastes described in the K179 or K180 listings, but which do not contain any of the constituents of concern for K179 or K180, would not be K179 or K180 hazardous wastes at the point of generation. You should note, however, that absence of the constituents of concern in some portion of your wastes would not relieve you, the generator, from hazardous waste determination requirements for all other wastes that do contain constituents of concern.

If your paint manufacturing wastes contain one or more constituents of concern, then you would either use the two-tiered approach to determine whether they are nonhazardous or handle them as hazardous. Under this proposed approach, if you generate or expect to generate 40 metric tons or less of paint manufacturing waste solids or 100 metric tons or less of paint manufacturing waste liquids annually, then you would have the option of testing the wastes or using knowledge of the wastes to determine whether they are nonhazardous. However, if you generate or expect to generate over 40 metric tons of paint manufacturing waste solids or over 100 metric tons of paint manufacturing waste liquids, then you would be required to test the wastes annually to determine whether they are nonhazardous. Our reasons for proposing a two-tiered approach and requiring annual testing of larger quantity wastes are discussed in Section V.C. The exception to the annual testing requirement to determine whether wastes are nonhazardous, regardless of annual waste quantities generated, would be for paint manufacturing waste liquids that are stored or treated exclusively in tanks or containers and then discharged to a POTW or under a NPDES permit.

We are proposing the constituents of concern for the two types of wastes (solids and liquids) from paint production that are listed in Tables IV.A–1 and IV.A–2. We are also proposing the listing (hazardous concentration) level for each of these constituents that are in the same tables. We are proposing that you use this information, in conjunction with testing or knowledge of constituent levels in your wastes, to determine whether or not the wastes are hazardous.

Unless you make a determination that your wastes are nonhazardous for K179 or K180, using either knowledge that the wastes do not contain any of the constituents of concern or the specified procedures described in section C below, then we are proposing that your wastes would be hazardous and you would be subject to the existing requirements under RCRA for persons who generate hazardous waste. Thus, if you are not already a hazardous waste generator, you would have to notify the EPA, according to section 3010 of RCRA, that you generate a hazardous waste. You would also be subject to all applicable requirements for hazardous waste generators in 40 CFR Part 262.

If you determine that your paint manufacturing waste solids or liquids are nonhazardous, we are proposing to require, under the authority of sections 2002 and 3007 of RCRA, that you keep certain records (see Section E below) of your wastes at the generating site (on-site). Following the initial nonhazardous determination, you would be obligated to ensure that your wastes continue to meet all of the proposed conditions and requirements for the wastes to be deemed nonhazardous. Accordingly, you should also note that regardless of any type of nonhazardous determination that you make for your wastes, the wastes would be hazardous if we test and find that they actually have constituents of concern at or above the listing levels.

A. Would I Have to Determine Whether or Not My Wastes Are Hazardous?

Yes, we are proposing that you must determine whether or not your wastes are hazardous K179 or K180 wastes. This hazardous waste listing determination could be made in either of two ways. First, you could assume that your wastes are hazardous at the point of generation. If you do this, then you could forego the requirement for testing or using knowledge of the wastes to make a hazardous waste determination. In such a case, your wastes would be subject to all applicable RCRA Subtitle C hazardous waste requirements, including LDR requirements, either as of effective date of the final rule or as of initial generation of the wastes. Second, if you want the opportunity to determine that your wastes are nonhazardous at the point of generation (and therefore not subject to Subtitle C hazardous waste requirements), we are proposing that you must either test the wastes or use knowledge of constituent concentrations in the wastes using the procedures described in Section C below. The only exception to using procedures in Section C to determine that your wastes are nonhazardous would be if you generate paint manufacturing waste liquids that will be stored or treated exclusively in tanks or containers.

B. How Would I Manage My Wastes During The Period Between the Effective Date of The Final Rule and Initial Hazardous Waste Determination for My Wastes?

If you generate wastes that are described in either K179 or K180, we are proposing that you could not dispose of your wastes as nonhazardous until you complete an initial determination which shows that your wastes are nonhazardous except for

[44] Due to the uncertainties in our assessment of the management of paint manufacturing waste liquids in surface impoundments, we are considering an alternative proposal not to list paint manufacturing waste liquids. We describe this alternative elsewhere in this notice (see Section IV.D). The following discussion describes the approach we are proposing for paint manufacturing waste liquids if K180 is listed.

waste liquids managed exclusively in tanks or containers prior to discharge to a POTW or under a NPDES permit. In the interim (from the time you generate the wastes to the time you make a determination on your wastes), you would be responsible for storing your wastes properly. If your wastes are determined to be hazardous and you are not complying with the Subtitle C storage requirements during the interim period, then you would be subject to an enforcement action for improper storage.

C. What Procedures Would I Follow to Determine If My Wastes Are Nonhazardous?

We are proposing that you use the following procedures annually to determine if your wastes, which contain one or more constituents of concern, are nonhazardous at the point of generation:

1. You must use the previous year's waste generation data (previous 12 consecutive months) or, if this data is not available, estimate the total annual quantities of paint manufacturing waste solids and paint manufacturing waste liquids that you expect to generate over the next 12 consecutive months based on current knowledge. You must combine the quantities of hazardous wastes (characteristic and otherwise listed) and nonhazardous wastes that meet the listing description for K179 or K180 to separately determine the total annual waste quantities for both the paint manufacturing waste solids and paint manufacturing waste liquids. Then, you must record the total annual quantities of paint manufacturing waste solids and paint manufacturing waste liquids that you expect to generate. If you initially estimate that your waste generation would fall under the low volume tier and, at any time within the 12 month period, the actual quantities of wastes you generate fall within the upper volume tier, from that point, you would be subject to the upper tier waste analysis requirements (see step 2 below). If you have not already tested your wastes, you must test your wastes. We are proposing that a new 12 month period for hazardous waste determination would start when you actually exceed the lower volume tier limit.

2. You must use the recorded total annual quantities of paint manufacturing waste solids and paint manufacturing waste liquids generated by your facility to determine the appropriate annual waste analysis requirement for your wastes in accordance with the following tables:

TABLE V.C–1.—TIERED WASTE ANALYSIS REQUIREMENTS FOR SOLIDS

Total annual quantity of hazardous and nonhazardous paint manufacturing waste solids	Annual waste analysis requirement
40 metric tons and less	Test Wastes or Use knowledge of Wastes.
Over 40 metric tons	Test Wastes.

TABLE V.C–2.—TIERED WASTE ANALYSIS REQUIREMENTS FOR LIQUIDS

Total annual quantity of hazardous and nonhazardous paint manufacturing waste liquids	Annual waste analysis requirement [a]
100 metric tons and less	Test Wastes or Use knowledge of Wastes.
Over 100 metric tons	Test Wastes.

[a] This requirement does not apply if the liquid wastes are stored or treated exclusively in tanks or containers and then sent to POTW or discharged under a NPDES permit.

We are proposing to establish the volume cut-offs in the above tables based on the § 3007 survey data on the annual quantities of solid and liquid wastes generated by paint production facilities. We used these data to develop the distributions for total hazardous and nonhazardous solid and total hazardous and nonhazardous liquid waste quantities generated across the sampled population of paint production facilities (see docket for Document on Distributions of Paint Production Wastes Generated). It was evident from these distributions that a relatively large percentage of the total hazardous and nonhazardous paint manufacturing wastes are generated by a relatively small percentage of the paint production facilities. For both paint manufacturing waste solids and liquids, approximately 90 percent of the total hazardous and nonhazardous wastes are generated by fewer than 20 percent of the paint production facilities. Based on this observation and in order to minimize the burden on small generators, we decided to propose this two-tiered implementation approach for the concentration-based listings. The tiered approach will allow small generators the option of testing or using knowledge of their wastes to determine whether or not their wastes are hazardous.

The annual quantity cut-off for wastes above which testing is required (40 metric tons for waste solids and 100 metric tons for waste liquids) is intended to ensure that the largest quantities of wastes generated by paint production facilities are tested and, at the same time, to minimize the burden on small generators. Using the cut-off quantities should result in approximately 90 percent of the total hazardous and nonhazardous paint manufacturing waste solids and paint manufacturing waste liquids being tested annually. Using the cut-off quantities also means that fewer than 20 percent of the facilities would be required to test their wastes annually, and more than 80 percent of the facilities would have the option of using knowledge. We believe that larger quantities of wastes have the potential for posing greater environmental risk than smaller quantities of wastes if a nonhazardous determination based on knowledge turns out to be inaccurate. Therefore, we believe it is reasonable to require larger quantity waste generators to test their wastes annually to make a determination, while smaller quantity waste generators are given the option to either test their wastes or use knowledge of their wastes annually to make a determination. We request comment on the appropriateness of giving smaller quantity waste generators the option of using knowledge of their wastes annually. We will consider requiring smaller quantity waste generators to test their wastes annually, like the larger quantity waste generators, if significant and defensible arguments are presented by commenters to support these requirements as necessary and appropriate.

We also request comment on an alternative to the two-tiered implementation approach discussed above for implementing the concentration-based listings proposed in today's rule. We could adopt a more streamlined approach for waste generators to use in implementing the concentration-based listings for these wastes. The streamlined implementation approach would allow you to rely on process knowledge or testing (i.e., lower volume tier requirements) regardless of the volume of waste generated. If the wastes contain any constituent of concern at or above the final risk-based listing levels, the waste would be subject to Subtitle C requirements. The streamlined implementation approach would be similar to the existing program for determining whether a waste exhibits a hazardous characteristic. Although we prefer the two-tiered approach being proposed in today's rule, we will give careful consideration to any arguments presented or relevant waste analysis data submitted in response to today's proposal (e.g., data showing that only a small portion of the waste streams in the industry exceed the listing levels) in order to decide whether a more streamlined approach is warranted.

1. Testing Wastes

If the total annual quantity of your paint manufacturing waste solids or paint manufacturing waste liquids which meet the listing description of K179 or K180 falls into the tier where testing is required (and you have decided not to assume that your wastes are hazardous at the point of generation), we are proposing that you must test your wastes to determine whether they are nonhazardous. (Even if testing is required to determine that your wastes are nonhazardous, you could still use knowledge of your wastes to document that a constituent (or constituents) could not be present in your wastes and not test for that constituent (or constituents)). However, knowledge of the wastes could not be used to determine the level of constituent in your wastes.

For those wastes that you must test, we are proposing that you use the following procedures:

(i) Develop a waste sampling and analysis plan (if you do not already have one that is appropriate) to collect and analyze samples that are representative of your wastes. We discuss the waste sampling and analysis plan later in this section.

(ii) From the list of constituents of concern for paint manufacturing waste solids or paint manufacturing waste liquids, select the constituents that are reasonably expected to be present in your wastes based on your knowledge of the wastes (e.g., knowledge of the constituents in your wastes based on existing sampling and analysis data and/or information about raw materials used, production processes used, and degradation products formed).

(iii) Collect an appropriate number of samples that are representative of your wastes and analyze each for the constituents of concern selected in step (ii).

(iv) Compare the sampling and analysis results for the constituents of concern in your wastes to the listing levels established for these constituents to determine if your wastes are nonhazardous.

(v) After completing annual testing requirements for your wastes, if all samples taken during any three consecutive years are determined to be nonhazardous, then the annual testing requirements for your wastes are suspended.

(vi) After suspension of the annual testing requirements for your wastes, if paint manufacturing, formulation, or waste treatment processes are significantly altered (i.e., if it could result in significantly higher levels of the constituents of concern for K179 or K180), then the annual testing requirements for your wastes are reinstituted. In order to again suspend the annual testing requirements for your wastes, the requirement under step (v) above has to be met.

a. *Waste Sampling and Analysis Plan.* Whenever you are required to test, we are proposing that you must develop a waste sampling and analysis plan prior to testing your wastes. In developing a sampling and analysis plan, you would have to consider any expected fluctuations in concentrations of constituents of concern over time. The sample design should be described in the waste analysis plan. The sample design and the sensitivity of the analytical methods used should be sufficient to determine whether the levels of the constituents of concern in the wastes are above or below the listing concentrations for these constituents. We do not propose to specify a particular number of samples that you would need to collect annually to obtain representative data for your wastes. The number of samples required to determine that the concentrations of constituents of concern in your wastes are below the listing levels for these constituents would depend on how close the actual concentrations were to the listing concentrations and on the variability of the wastes you generated during the course of the year.

As stated in step (ii) of the procedures specified above, you would have to test for the constituents of concern that are reasonably expected to be present in your wastes. Also, as discussed previously, you might use knowledge of the wastes to document that a constituent (or constituents) could not be present in your wastes. If you determine that a constituent (or constituents) could not be present in your wastes, then you would not need to test for it. However, if you determine that your wastes are nonhazardous, then you would be responsible for ensuring that your wastes do not have any constituents of concern at or above the listing levels.

We are not proposing whether you must use grab or composite sampling to obtain samples that are representative of your wastes. However, we are proposing that, following a nonhazardous determination for your wastes, enforcement by EPA or an authorized State would be based on grab samples. It would be your responsibility to ensure that your sampling and analysis is unbiased, precise, and representative of your wastes. We are not proposing to require the use of SW–846 methods to comply with these requirements. We are proposing to allow the use of either SW–846 methods or alternative methods, so long as you can demonstrate that the selected methods have the appropriate sensitivity, bias, and precision to determine the presence or absence of the constituents of concern at or below the listing concentrations. You would be required to document the: (1) Detailed standard operating procedures (SOPs) for the sampling and analysis protocols that you used; (2) sensitivity and bias of the measurement process; (3) precision of the analytical results for each batch of waste (or "super" batch) tested; and (4) analytical results.

We would consider the analytical results adequate to demonstrate that concentrations for the constituents of concern in your wastes are below the listing concentrations for these constituents if: (1) You determined the concentrations without dilution of the wastes (i.e., no waste or other material were added to your wastes, after the point of generation, which did not meet the listing description of K179 or K180) and (2) you conducted an analysis in which the constituents of concern spiked at their listing levels indicates that the constituents of concern are present at those levels within analytical method performance limits (e.g., sensitivity, bias, and precision). To determine the performance limits for a method, we recommend following quality control (QC) guidance provided in Chapters One and Two of SW–846.

Following sampling and analysis, if none of your waste samples contain any of the constituents of concern at concentrations equal to or greater than the listing levels established for these constituents, then you would determine that your tested wastes are nonhazardous. Once you have determined your tested wastes to be nonhazardous, you would decide if these wastes are representative of the wastes that you will generate for the remainder of the year. If your tested wastes are representative (or you can reliably determine that these wastes exhibited the maximum concentrations for the constituents of concern), then you could determine that the wastes (or certain type of wastes) that you generate for the remainder of the year are also nonhazardous. As stated earlier, following a nonhazardous determination, you would have an obligation to ensure that your wastes continue to meet all of the conditions (i.e., constituents of concern in your wastes remain below listing levels) and requirements (i.e., records that support a nonhazardous determination) for the wastes to be deemed nonhazardous. We are also proposing annual follow-up sampling and analysis for wastes that you determine to be nonhazardous to check that these wastes continue to remain nonhazardous. However, if any of your waste samples contain any of the constituents of concern at a concentration equal to or greater than the listing level set for that constituent, your wastes would be listed hazardous wastes and are thereby subject to all applicable RCRA Subtitle C hazardous waste requirements.

We are proposing that the maximum concentration of any constituent detected in any sample must be below the established listing level in order for you to determine that the waste is nonhazardous. We are proposing this approach because we believe it is the most straightforward to ensuring concentrations are below risk-based listing levels. However, we request comment on whether the generator should be allowed to average the concentrations of constituents detected in multiple waste samples taken from some quantity of waste generated or collected over a certain period of time (e.g., 60 days). Under that approach, the generator would calculate concentrations using an upper confidence limit on the mean (e.g., 95th percentile) to compare to the listing levels established for the constituents.

We also request comment on whether the annual testing requirement should be continued beyond three years, if the generator determines the wastes to be nonhazardous for three consecutive years. Following suspension of annual testing requirements, the generator would still be liable if testing by EPA or an authorized State finds the waste to be hazardous.

2. Using Knowledge of The Wastes

Where testing is not required, or as a supplement to testing, we are proposing that you could use knowledge of your wastes (e.g., knowledge of the constituents in your wastes based on existing sampling and analysis data and/or information about raw materials used, production processes used, and degradation products formed) to conclude that concentrations for the constituents of concern in your waste would be below the listing levels (nonhazardous waste).

D. How Would The Proposed Contingent Management Listing for Liquid Wastes be Implemented?

Under this proposed listing, paint manufacturing waste liquids that meet the K180 listing description would be hazardous wastes unless managed exclusively in tanks or containers prior to discharge to a POTW or under a NPDES permit. If your liquid paint manufacturing wastes are going to be stored or treated in units other than tanks or containers, then they would be hazardous wastes unless you have determined (using the procedures described in Section C) that the constituents of concern in the waste liquids are below the listing levels. Therefore, you would need to determine as soon as the paint manufacturing waste liquids are generated whether they will be stored or treated in units other than tanks or containers. If your paint manufacturing waste liquids will be stored or treated in units other than tanks or containers, your wastes would be subject to the management requirements discussed in Section B above. If you are storing or treating paint manufacturing waste liquids on-site in tanks or containers prior to off-site disposal, you would need to maintain documentation showing that the wastes will be stored or treated exclusively in tanks or containers off-site prior to their discharge to a POTW or discharge under a NPDES permit. If the off-site disposal facility does not store or treat your paint manufacturing wastes exclusively in tanks or containers and the waste contains levels of constituents at or above the risk-based listing levels, then your wastes would be hazardous and you would need to store the wastes in accordance with the Subtitle C requirements applicable to storage of a hazardous waste.

E. What Records Would I Need to Keep On-site to Support a Nonhazardous Determination for My Wastes?

To support a nonhazardous determination, we are proposing that you must keep records of the total annual quantity of paint production waste solids and liquids from tank and equipment cleaning operations that use solvents, water, and/or caustic; emission control dusts or sludges; wastewater treatment sludges and off specification product for the most recent three years from the effective date of the final rule. If you generate a total annual quantity of paint manufacturing wastes that exceeds 40 metric tons for paint manufacturing waste solids or 100 metric tons for paint manufacturing waste liquids, we are proposing that you keep the following records on-site for the most recent three years:

1. The documentation supporting a determination that wastes are nonhazardous based on knowledge that they do not contain any of the constituents of concern.

2. If you determine that wastes are nonhazardous based on testing, then you must keep the following records on-site:

a. The sampling and analysis plan used for collecting and analyzing samples representative of your wastes, including detailed sampling methods used to account for spatial and temporal variability of the wastes, and sample preparative, cleanup (if necessary) and determinative methods.

b. The sampling and analysis data (including QA/QC data) and knowledge (if used to determine that one or more constituents of concern are not present in the wastes) that support a nonhazardous determination for your wastes (for the most recent three years of testing).

3. If storing or treating paint manufacturing waste liquids on-site in tanks or containers prior to off-site disposal, the documentation showing that the paint manufacturing waste liquids will be stored or treated solely in tanks or containers off-site before discharge by a facility to a POTW or discharge under an NPDES permit.

We request comment on the adequacy of the above recordkeeping requirements to support a nonhazardous determination.

F. What Would Happen if I Do Not Meet The Recordkeeping Requirements for The Wastes That I Have Determined Are Nonhazardous?

We are proposing to require recordkeeping under the authority of sections 2002 and 3007 of RCRA. These are requirements and not conditions of the waste being nonhazardous. A condition is a standard that you or your waste must meet in order for your waste to become or remain nonhazardous. If a condition is not fulfilled, then the waste is hazardous and subject to RCRA Subtitle C requirements. A requirement is an obligation whose violation would not affect the nonhazardous status of the waste, but would be a violation under RCRA. Failure to comply with these requirements could result in an enforcement action under section 3008 of RCRA. This section of the statute authorizes the imposition of civil penalties in an amount up to $27,500 for each day of noncompliance.

G. Could I Treat My Wastes to Below Listing Concentrations and Then Determine That My Wastes Are Nonhazardous?

1. Paint Manufacturing Waste Solids

If your paint manufacturing waste solids are hazardous (K179) at the point of generation, we are proposing that you could treat the wastes to make them nonhazardous (i.e., remove the K179 hazardous waste code from your wastes). However, if your wastes are K179, they would be required to be treated to meet the proposed LDR treatment standards (see Section VI D.) before placement in a land-based unit. Following LDR treatment, you could choose to use the initial hazardous waste determination procedures for K179 wastes (see Section C above) to determine if your treated waste residuals are nonhazardous. If your treated waste residuals are determined to be nonhazardous, they would no longer be subject to the requirements of Subtitle C. In other words, the derived from hazardous waste code would no longer attach to such treatment residuals.

2. Paint Manufacturing Waste Liquids

If your paint manufacturing waste liquids are hazardous (K180) at the point of generation because the concentration of the constituents of concern are not below the listing levels and they are not stored or treated solely in tanks or containers prior to discharge, then they would also be required to be treated to meet the proposed LDR treatment standards (see Section VI.D). However, we are proposing that the treatment of the K180 liquid wastes (e.g., to meet the proposed LDR treatment standards) would not result in the removal of the K180 hazardous waste code from your liquid residual wastes. This is because the proposed listing levels for K180 are for the waste prior to any mixing and would necessarily be higher than the levels of the constituents that may exit in the liquid paint wastes mixed with other wastewaters in an off-site impoundment. Therefore, we believe that the use of listing levels for K180 would not protect against paint manufacturing waste liquids being placed on land.

VI. Proposed Treatment Standards Under RCRA's Land Disposal Restrictions (LDRs)

A. What Are EPA's LDRs?

The RCRA statute requires EPA to establish treatment standards for all wastes destined for land disposal. These are the so called ''land disposal restrictions'' or LDRs. For any hazardous waste identified or listed after November 8, 1984, EPA must promulgate LDR prohibitions and treatment standards within six months of the date of identification or final listing (RCRA section 3004(g)(4), 42 U.S.C. 6924(g)(4)). RCRA also requires EPA to set as these treatment standards ''* * * levels or methods of treatment, if any, which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized.'' RCRA section 3004(m)(1), 42 U.S.C. 6924(m)(1). Once a hazardous waste is prohibited, the statute provides only two options for legal land disposal: meet the treatment standard for the waste prior to land disposal, or dispose of the waste in a land disposal unit that satisfies the statutory no migration test. A no migration unit is one from which there will be no migration of hazardous constituents for as long as the waste remains hazardous. RCRA sections 3004 (d), (e), (f), and (g)(5).

B. How Does EPA Develop LDR Treatment Standards?

To establish LDR treatment standards, EPA first identifies the best demonstrated available technology (BDAT) for the hazardous constituents present in the hazardous waste, and then determines what constituent concentrations can be achieved by the technology or technologies identified as BDAT.

EPA typically has established treatment standards based on performance data from the treatment of the waste at issue, if such data are available, and also from the treatment of wastes with similar chemical and physical characteristics or similar concentrations of hazardous constituents. Treatment standards typically cover both wastewater and nonwastewater waste forms on a constituent-specific basis. The constituents selected for regulation under the LDR program are not necessarily limited to those present in a proposed listing, but also may include those constituents or parameters that will ensure that treatment technologies are operated properly. For listed waste EPA identifies these as ''regulated constituents'' and they appear individually in the Table at 40 CFR 268.40, along with their respective treatment standards.

EPA may develop and promulgate either technology-specific treatment standards or numerical treatment standards. Should EPA elect to use technology-specific standards (*i.e.,* mandate use of a particular type of treatment technology), all wastes that meet the listing designations would have to be treated by the technology or technologies specified before disposal. These technologies are also identified in the Table at § 268.40 and are further described in § 268.42. Should EPA elect to use numerical treatment standards, the Agency allows the use of any technology (other than impermissible dilution) to comply with the treatment standards.

With the advent of the so-called Universal Treatment Standards (UTS) (the same numerical standards for common hazardous constituents in all prohibited hazardous wastes), EPA has somewhat refined this approach. Thus some of the evaluation of treatability goes to the issue of how well the UTS express potential treatability of a prohibited hazardous waste. Given that the UTS typically reflect performance of the best treatment technologies and minimizing threats, and the enormous savings in administrative expense to both the regulated communities and to EPA, EPA seeks to apply the UTS wherever technically justified. See generally 59 FR 47988–991 (September 19, 1994).

After developing the LDR treatment standards, we must also determine if adequate treatment capacity is available to treat the expected volumes of wastes. If so, the LDR treatment standards become effective essentially at the same time a listing does. If not, EPA may grant up to a two-year national capacity variance (NCV) during which time the LDR treatment standards are not effective.

For a more detailed overview of the Agency's approach for developing treatment standards for hazardous wastes, see the final rule on solvents and dioxins (51 FR 40572, November 7, 1986) and section III.A.1 of the preamble to the final rule that set land disposal restrictions for the ''Third Third'' wastes (55 FR 22535, June 1, 1990). EPA also has explained its BDAT procedures in ''Best Demonstrated Available Technology (BDAT) Background Document for Quality Assurance/Quality Control Procedures and Methodology (EPA/OSW, October 23, 1991)''. This document is available in the docket supporting this rulemaking.

C. What Treatment Standards Are Proposed?

For the hazardous constituents found in wastes from the manufacture of paints, hazardous waste numbers K179 and K180, we are proposing to transfer existing numerical or universal treatment standards to the hazardous constituents identified in the wastes, with the exception of formaldehyde and styrene. We believe that it is technically feasible to apply these existing numerical standards to the hazardous constituents of K179 and K180, because the waste compositions are similar to other wastes for which applicable treatment technologies have been demonstrated. Due to the uncertainties in our assessment of the management of paint manufacturing waste liquids in surface impoundments, we are also considering an alternative proposal not to list paint manufacturing waste liquids. We describe this alternative elsewhere in this notice (see Section IV.D). If we do not list wastes under K180, then there would be no need for any standards for formaldehyde or styrene. The following discussion describes the approach for treatment standards assuming that paint manufacturing waste liquids are listed under K180.

The hazardous constituents formaldehyde and styrene do not have existing numerical standards. For formaldehyde, we are proposing to require treatment by designated methods. When formaldehyde is present in K180 at levels triggering the listing, formaldehyde thus would be treated by the required technologies. (The other hazardous constituents must, of course, be treated to meet the applicable numerical standards.) Wastes that do not trigger the listing based on formaldehyde would not be subject to the formaldehyde technology requirement, but would be subject to all other numerical standards. The technology standards proposed for formaldehyde-listed K180 wastewaters are wet air oxidation (WETOX) or chemical or electrolytic oxidation (CHOXD) followed by carbon adsorption (CARBN); or combustion (CMBST). For nonwastewaters forms of K180, the technology standard proposed is combustion. These are the same treatment standards currently applicable to discarded product, off specification, container residues, and spill residues of formaldehyde (EPA hazardous waste U122).

For styrene, we are proposing numerical standards developed for this rulemaking. We are proposing a wastewater standard of 0.028 mg/L based on activated sludge treatment and a nonwastewater standard of 28.0 mg/kg based on thermal destruction of sludge. Alternatively, we propose the transfer of the ethylbenzene treatment standards of 0.057 mg/L for wastewaters, and 10 mg/kg for nonwastewaters, because of its structural similarity and similar physical properties with styrene similar treatment technologies have been demonstrated. Ethylbenzene and styrene have the same number of carbon atoms, and differ only in that styrene has one additional double bond and hence two fewer hydrogen atoms in its structure. See supporting background documents for the additional discussion on the derivation of the UTS for this new constituent.

Wastes identified as K179 or K180 may already be subject to hazardous waste regulation, because they exhibit a characteristic or are listed F001–F005 wastes. If promulgated, the treatment standards for K179 and K180 will apply in addition to any treatment requirements the wastes are currently subject to. Section 268.9(b) of current rules states that if a treatment standard for a listed waste which also exhibits a characteristic addresses the hazardous constituent which causes the waste to exhibit the characteristic, then, the waste is only subject to the treatment standard for the listed waste. Applied to these paint manufacturing wastes, therefore, the most likely result is that these wastes would be subject only to the treatment standards for K179 and K180 assuming that presence of organic hazardous constituents addressed in the treatment standard for the listed waste causes these wastes to exhibit a characteristic.

The treatment standards proposed are based on technology performance and not upon the listing levels of concern derived from the Paint Risk Assessment. In the Hazardous Waste Identification Rule proposed November 19, 1999, we outlined ways in which the HWIR risk assessment could be used to develop risk-based LDR levels (see 64 FR 63444, November 19, 1999), because the HWIR risk assessment evaluated the potential for constituent migration through the most significant environmental fate and transport pathways, looked at the total impact of those pathways, and considered a great number of ecological benchmarks. In the Paint Risk Assessment, we also have a substantial multipathway risk assessment that could potentially lead to treatment standards which could be either more lenient or stricter than current standards.

However, the listing levels proposed for K180 are for the waste prior to any mixing, and would necessarily be higher than the levels of the constituents that may exist in the off-site impoundment. Therefore, we believe the listing levels for K180 may not be appropriate for use in estimating minimized threat levels, because they do not correspond to risk-based levels for the diluted waste in the impoundment. The levels indicated would not be applicable as ''universal'' risk-based treatment standards (as we hope HWIR could eventually be).

Our preference is to develop a single set of treatment levels that would be applicable to all hazardous wastes. Waste-by-waste modeling would not only be highly resource intensive, but could lead to the potentially false conclusion that higher levels are justified only to realize that if we look at a range of wastes together we might conclude that more stringent treatment standards are needed to minimize threat to human health and the environment. Therefore, we believe the proposed listing levels are not minimized threat levels across all wastes and have chosen to propose treatment standards based on the performance of the best determined available technology (BDAT). We believe that there is still uncertainty as to what quantified levels minimize threats to human health and the environment, and therefore, we are proposing standards based on the performance of the BDAT. See *HWTC* vs. *EPA*.886 f. 2d 355, 361–63 (D.C. Cir. 1989) (accepting this approach).

The proposed treatment standards are set out in Table VI–1 below. Where EPA is proposing numerical concentration limits the use of any technology capable of achieving the proposed treatment standards would be allowed, except those treatment or reclamation practices constituting land disposal or impermissible dilution (see 40 CFR 268.3). As stated above, when formaldehyde is present in K180 at levels triggering the listing, we are proposing that formaldehyde must be treated by the required technologies. The other hazardous constituents would, of course, be treated to meet the applicable numerical standards.

TABLE VI–1.—TREATMENT STANDARDS FOR HAZARDOUS WASTE K179 AND K180

Regulated hazardous constituent: Common name	CAS[1] No.	K179 solids	K180 liquids	Wastewaters: Concentration in mg/L,[2] or technology code[3]	Nonwastewaters: Concentration in mg/kg[4] unless noted as "mg/L TCLP", or technology code[3]
Acrylamide	79–06–1	X	X	19	23
Acrylonitrile	107–13–1	X	X	0.24	84
n-Butyl alcohol	71–36–3		X	5.6	2.6
Ethyl benzene	100–41–4		X	0.057	10
Formaldehyde[5]	50–00–0		X	(WETOX or CHOXD) fb CARBN; or CMBST.	CMBST
Methylene chloride	75–09–2		X	0.089	30
Methyl isobutyl ketone	108–10–1	X	X	0.14	33
Methyl methacrylate	80–62–6	X	X	0.14	160
Styrene	100–42–5		X	0.028	28
Toluene	108–88–3		X	0.080	10
Xylenes—mixed isomers (sum of o-, m-, and p-xylene concentrations).	1330–20–7		X	0.32	30
Antimony	7440–36–0	X	X	1.9	1.15 mg/L TCLP

[1] CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with its salts and/or esters, the CAS number is given for the parent compound only.
[2] Concentration standards for wastewaters are expressed in mg/L and are based on analysis of composite samples.
[3] All treatment standards expressed as a Technology Code or combination of Technology Codes are explained in detail in 40 CFR 268.42 Table 1–Technology Codes and Descriptions of Technology-Based Standards.
[4] Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance with the technical requirements of 40 CFR Part 264, Subpart O, or Part 265, Subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 40 CFR 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.
[5] Wastes that do not exceed the § 261.32 listing criteria for this constituent are not subject to the treatment technology requirements, but are subject to all other numerical standards.

D. Other LDR-Related Provisions

1. F039 Multisource Leachate and Universal Treatment Standards

F039 applies to multiple listed hazardous waste landfill leachates in lieu of the original waste codes, and F039 wastes are subject to numerical treatment standards applicable to all listed wastes. To maintain the regulatory implementation benefits of having one waste code for multisource leachate, the treatment standards for F039 must be updated to include the constituents of newly listed wastes. Otherwise, multiple waste codes would again be applicable. Therefore, we propose to add to F039 the additional constituents acrylamide and styrene. We also propose to add the numerical standards for styrene to the Universal Treatment Standards of 40 CFR 268.48[45] Characteristic wastes are already subject to treatment standards for acrylamide. As a result, characteristic wastes subject to treatment requirements for underlying hazardous constituents will also have to comply with these treatment standards.

[45] As noted previously, we are considering an alternative proposal not to list paint manufacturing waste liquids. If we do not like K180, then there would be no need to add styrene to the F039 or UTS standards.

We are proposing these changes, because acrylamide and styrene are toxic constituents. When paint manufacturing (or production) wastes are managed with other wastes at commercial treatment facilities, the combined waste residues that result for disposal would need to meet all part 268 requirements, including requirements for C disposal, if the paint listing codes were retained or mixed with other listed wastes. The new listing codes may also be retained if treatment meets only the LDR standards and not the listing levels. Thus, leachates that could be subject to multiple codes could be formed. By adding these constituents to F039, the regulatory benefits of having one waste code for multisource leachate is maintained.

Based on the treatment studies compiled for acrylamide and styrene, we believe the proposed treatment standards for these constituents can readily be achieved in the F039 leachate wastes, and in characteristic wastes. Nevertheless, we request comments on this assumption.

E. Is There Treatment and Management Capacity Available for These Proposed Newly Identified Wastes?

1. What Is a Capacity Determination?

EPA must determine whether adequate alternative treatment capacity exists nationally to manage the wastes subject to LDR treatment standards. RCRA Section 3004(h)(2). Thus, LDRs to be made effective immediately—in this case when the new listings are effective (typically 6 months after the new listings are published in the **Federal Register**)—unless EPA grants a national capacity variance from the otherwise-applicable date and establishes a different date (not to exceed two years beyond the statutory deadline) based on "the earliest date on which adequate alternative treatment, recovery, or disposal capacity which protects human health and the environment will be available" (RCRA Section 3004(h)(2), 42 U.S.C. 6924(h)(2)).

Our capacity analysis methodology focuses on the amount of waste currently disposed on the land, which will require alternative or additional treatment as a result of the LDRs. The quantity of wastes that is not disposed on the land, such as treatment in tanks, is not included in the quantities requiring additional treatment as a result of the LDRs. Also, land-disposed wastes that do not require alternative or additional treatment (i.e., those that currently are treated to meet the LDR treatment standards) are excluded from the required capacity estimates. Land-disposed wastes requiring alternative or additional treatment or recovery capacity that is available on-site or within the same company also are excluded from EPA's estimates of needed commercial capacity. EPA then compares the resulting estimates of required commercial capacity to estimates of available commercial capacity. If adequate commercial capacity exists, the waste is restricted from further land disposal. If protective alternative capacity does not exist, EPA has the authority to grant a national capacity variance.

In making the estimates described above, the volume of waste requiring treatment depends on the current waste management practices employed by the waste generators before this proposed regulation is promulgated and becomes effective. Data on waste management practices for these wastes were collected during the development of this proposed rule. However, we realize that as the regulatory process proceeds, generators of these wastes may decide to minimize or recycle their wastes or otherwise alter their management practices. Thus, we will monitor changes and update data on current management practices as these changes will affect the volume of wastes ultimately requiring commercial treatment or recovery capacity.

The commercial hazardous waste treatment industry may change rapidly. For example, national commercial treatment capacity changes as new facilities come on line or old facilities go off line, and as new units and new technologies are added at existing facilities. The available capacity at commercial facilities also changes as facilities change their commercial status (e.g., changing from a fully commercial to a limited commercial or ''captive''—company owned—facility). Thus, we also continue to update and monitor changes in available commercial treatment capacity.

For wastes required to meet today's proposed treatment standards, we request data on the annual generation volumes and characteristics of wastes affected by this proposed rule, including proposed hazardous wastes K179 and K180 in wastewater and nonwastewater forms. We also request data on soil or debris contaminated with these wastes, residuals generated from the treatment or recycling of these wastes, and the current and planned management practices for the wastes, waste mixtures, and treatment residuals.

For available capacity to meet the LDR requirements, we request data on the current treatment or recovery capacity capable of treating these wastes, facility and unit permit status related to treatment of the proposed wastes, and any plans that facilities may expand or reduce existing capacity or construct new capacity. In addition, we request information on the time and necessary procedures required for permit modification for generators or commercial treatment or disposal facilities to manage the wastes, required changes for operating practices due to the proposed listings or proposed additional constituents to be regulated in the wastes, and any waste minimization activities associated with the wastes. Of particular interest to us are chemical and physical constraints of treatment technologies for these wastes and any problems for disposing of these wastes. Also of interest are any analytical difficulties associated with identifying and monitoring the regulated constituents in these wastes.

2. What Are The Capacity Analysis Results?

This preamble only provides a summary of the capacity analysis performed to support this proposed regulation. For additional and more detailed information, please refer to the ''Background Document for Capacity Analysis for Land Disposal Restrictions: Newly Identified Paint Production Wastes (Proposed Rule), January 2001'' (i.e., the Capacity Background Document).

For this capacity analysis, we examined data on waste characteristics (such as whether the waste is a solid, solvent, or an aqueous waste) and management practices gathered for the paint manufacturing hazardous waste listing determination. We also examined data on available treatment or recovery capacity for these wastes. The sources for these data are the 2000 RCRA section 3007 survey and site visits (see the docket for this proposed regulation for more information on these survey instruments and facility activities), the available treatment capacity data submission that was collected in the 1990's, and the 1997 Biennial Report (BR).

We derived our estimated quantities requiring alternative or additional treatment to meet the LDR treatment standards from the estimated population for paint manufacturers (i.e., approximately one thousand paint manufacturing facilities in the United States, as discussed earlier for RCRA Section 3007 Survey (Section II.G)). K179 is paint manufacturing waste solid, so it is generated as a nonwastewater, as defined in 40 CFR 268.2(d) and (f) (i.e., nonwastewaters are wastes that do not meet the criteria for wastewaters which contain less than 1% by weight total organic carbon (TOC) and less than 1% by weight total suspended solids (TSS)). K180 is a paint manufacturing waste liquid and could be a nonwastewater or wastewater form based on the above definition.

Generally, facilities may combine a variety of wastes (for example, sludges from tank cleaning operations and wastewater treatment) and send their wastes off to one waste management unit. Some waste types are managed separately (for example, wastes with some value for fuel blending). We used weighted and extrapolated universe waste quantities from approximately one thousand paint manufacturing facilities for our capacity analysis. After examining waste generation quantities and their management practices, we estimated that approximately 17,000 tons per year of K179 and K180 wastes may require alternative or additional treatment to meet the LDR standards. This amount of waste covers the quantities which are currently land disposed, managed in a Subtitle D combustion unit, or uncertain on their management practices.

The quantities requiring alternative or additional treatment could be smaller because much of the proposed and newly identified paint manufacturing (or production) waste is mixed with existing listed and/or characteristic wastes which already had to meet the LDR requirements for at least some of the proposed constituents for K179 and K180 wastes. Also, most of the surveyed facilities that reported generation of waste residuals of concern under this listing determination reported that they recycled or reused the residuals to some extent. Furthermore, waste generated from the production batches are also generated in batches rather than in a continuous stream. We recognize the volume and type of paint produced, degree of automation, amount of non land-based recycling, age of facility, and the speed at which facilities may change product formulations can affect types and amount of waste generated. Therefore, the actual annual quantity of waste requiring commercial treatment may fluctuate due to these variations. However, we find that there is no shortfall for available commercial treatment capacity for these wastes proposed in today's rule. For a more detailed analysis regarding the amount of paint manufacturing (or production) wastes requiring treatment to meet the LDR standards, see the Capacity Background Document in the public docket for this proposed rule.

As discussed in the section for the LDR treatment standards, we are proposing that numerical or technology-specific treatment standards be applied to K179 and K180 wastes, depending on the constituent in the wastes. For nonwastewater forms of these wastes, we anticipate that commercially available incineration, followed by stabilization if necessary (for antimony), can be used to meet these numerical treatment standards. For one organic constituent (formaldehyde) in wastewater and nonwastewater forms of K180, we are proposing to require treatment by specified methods. For formaldehyde in K180 wastewater we are proposing the following technologies as methods of treatment, wet air oxidation (WETOX) or chemical or electrolytic oxidation (CHOXD) followed by carbon adsorption (CARBN); or combustion (CMBST). For this constituent in the nonwastewater form of K180, the required technology standard proposed is combustion. We assume that facilities would achieve waste treatment standards using combustion, stabilization, or both for K179 and K180 wastes. The quantity of commercially available combustion capacity for sludge, solid, and liquids is well over one million tons per year based on 1997 Biennial Report data. The quantity of commercially available stabilization capacity is at least seven million tons per year based on 1995 Biennial Report data. Also, based on the data submittals in the early 1990's and 1997 BR data, we estimated that at least 34 million tons per year of commercial wastewater treatment capacity are available. Please note that facilities could use any available technologies (except impermissible dilution) to achieve the LDR numerical standards for these wastes.

Based on the results of the RCRA section 3007 survey and the site visits, we did not identify any paint manufacturing facilities that manage these proposed wastes in on-site surface impoundments. From the available information, we found that at least one wastewater treatment plant accepted proposed paint manufacturing waste liquids (K180) from the paint production industry, and the facility managed these wastes in a lined surface impoundment. Assuming such an impoundment satisfies requirements of section 3005(j)(11) (in essence, meets minimum technological requirements and is dredged annually), such wastes would not require treatment. If any wastes are managed in an impoundment not satisfying requirements of 3005(j)(11) (e.g., an unlined surface impoundment) of a wastewater treatment system, the wastes would be subject to land disposal prohibitions. However, we anticipate that very few facilities, if any, would manage the newly identified paint manufacturing wastes in such impoundments.

Based on the foregoing, we expect that sufficient capacity exists to treat the proposed K179 and K180 wastes that would require alternative or additional treatment. Therefore, we are proposing to not grant a national capacity variance for these wastes.

Further, soil and debris contaminated with these newly identified wastes may be subject to the LDRs (see LDR Treatment Standards for Soil in LDR Phase IV Final Rule, 63 FR 28602, May 26, 1998; 40 CFR 268.45 Treatment Standards for Hazardous Debris), but we believe that the contaminated soil and debris, if any, would not require substantial commercial treatment capacity. There are no data showing such contaminated soil and debris are currently generated. We expect that the majority of contaminated soil and debris, if generated, will be managed on-site. Therefore, we are not proposing to grant a national capacity variance for hazardous soil and debris contaminated with these wastes covered under this proposal.

Based on the RCRA section 3007 Survey conducted in early 2000 (which collected 1998 data), there are no data showing that the newly proposed wastes are managed by underground injection wells. Also, based on the 2000 RCRA section 3007 Survey, there are no data showing mixed radioactive wastes associated with the proposed listings. We are proposing to not grant a national capacity variance for underground injected wastes, mixed radioactive wastes (i.e., radioactive wastes mixed with K179 and K180), or soil and debris contaminated with these mixed radioactive wastes, if such wastes are generated.

Therefore, we propose that LDR treatment standards thus become effective when the listing determinations become effective for the wastes covered under today's rule. This conforms to RCRA section 3004(h)(1), which indicates that land disposal prohibitions must take effect immediately when there is sufficient treatment or disposal capacity available for the wastes. However, we may need to revise capacity analyses or capacity variance decisions if final listing determinations are changed or if we receive data and information to warrant any revision.

We request comments on the estimated quantities requiring alternative treatment and information on characteristics of the affected wastes, management practices for these wastes, and available treatment, recovery or disposal capacity for the wastes. We also request comments on whether any facility uses surface impoundment or underground injection to manage these wastes. In addition, we solicit comments on our decision not to grant a national capacity variance for any of the affected wastes. We will consider all available data and information provided during the public comment period and revise our capacity analysis accordingly in making the final capacity determinations. Please note that the ultimate volumes of wastes estimated to require alternative or additional commercial treatment may change if the final listing determinations change. Should this occur, we will revise the capacity analysis accordingly.

3. What Is the Available Treatment Capacity for Other Wastes Subject to Revised UTS and F039 Standards?

With respect to the revisions to the F039 and UTS lists, as discussed earlier in the section on K179 and K180 treatment standards, we are proposing to add acrylamide and styrene to the list of regulated constituents in F039 (40 CFR section 268.40). We are also proposing to add styrene to the UTS table (40 CFR section 268.48). Acrylamide is currently listed in the Appendix VIII of part 261. EPA is proposing to add styrene in the Appendix VIII as discussed in the earlier section (Section II). We have estimated what portion of the F039 or characteristic wastes (which require treatment of underlying hazardous constituents to UTS levels) may be required to meet these new treatment standards. We request comments on the estimates, the appropriate means of treatment (if necessary), and the sufficiency of available treatment capacity for the affected wastes by the addition of these constituents to the F039 and UTS lists.

When changing the treatment requirements for wastes already subject to LDR (including F039 under 40 CFR 261.31 and characteristic wastes under 40 CFR 261.24) for which the potential capacity variance periods have expired, EPA no longer has authority to use RCRA section 3004(h)(2) to grant a capacity variance to these wastes. However, EPA is guided by the overall objective of section 3004(h), namely that treatment standards which best accomplish the goal of RCRA section 3004(m) (to minimize threats posed by land disposal) should take effect as soon as possible, consistent with availability of treatment capacity.

We expect that only a limited quantity of hazardous waste leachate, if any, may be generated from the disposal of newly-proposed K179 and K180 wastes and added to the generation of leachates from other multiple restricted hazardous wastes already subject to LDR.

For the amount of characteristic wastes or leachates generated from those previously regulated hazardous wastes that would be subject only to the new treatment standards for these constituents, we evaluated the universe of wastes that might be impacted by revisions to the lists of regulated constituents for F039 and UTS based on limited information. Based on 1997 Biennial Report data and some assumptions of waste compositions and their potential for land disposal, we were able to estimate the potential need for additional treatment. For example, we estimated an upper bound of 7,000 tons per year of nonwastewaters mixed with other waste codes, the F039 leachate from which would be potentially impacted by the revision to the F039 treatment standards. In a similar fashion, we estimated that approximately 250,000 tons per year of characteristic nonwastewaters potentially might be affected by the proposed changes.

These upper bound estimates are most likely significantly overstated since only a portion of each estimated waste volume may contain the proposed additional constituents at concentrations above the proposed level specified in the UTS table and the F039 list. The estimates assume that these constituents are present at levels above the proposed treatment standards in all of these F039 and characteristically hazardous wastes and require alternative treatment, when it is likely that this may be true in only a small subset of the cases (as described in the Capacity Background Document). Furthermore, EPA does not anticipate that waste volumes subject to treatment for F039 or characteristic wastes would significantly increase because waste generators already are required to comply with the treatment requirements for other already regulated organic or metal constituents that may be present in the wastes. The volumes of wastes for which additional treatment is needed solely due to the addition of these constituents to the F039 and UTS lists are therefore expected to be small. See the Capacity Background Document for detailed analysis.

Even if we have underestimated the projected volume of wastes requiring treatment, we believe that there still would be no shortage of treatment capacity. Based on data submittals in the early 1990's and 1997 BRS data, EPA has estimated that at least 34 million tons per year of commercial wastewater treatment capacity are available, and approximately 1.6 million tons per year of liquid, sludge, and solid commercial combustion capacity are available. Also, as discussed earlier in this section, there are seven million tons of available stabilization capacity. These are well above the quantities of F039 or characteristic wastes potentially requiring treatment for the proposed additional constituents even under the conservative screening assumptions described above. Therefore, we are proposing a decision not to delay the effective date for adding these constituents to the lists of constituents for F039 and UTS.

We request comments on our proposed decision to not delay the effective date for adding these constituents to the lists of constituents for F039 and UTS. We request data on the annual generation volumes and characteristics of wastes affected by the proposed changes to UTS and F039 in wastewater and nonwastewater forms (if any), and the current and planned management practices for the wastes, waste mixtures, and treatment residuals. We also request data on the current treatment or recovery capacity available for treating the affected wastes.

VII. State Authority and Compliance

A. How Are States Authorized Under RCRA?

Under section 3006 of RCRA, EPA may authorize qualified States to administer and enforce the RCRA hazardous waste program within the State. (See 40 CFR Part 271 for the standards and requirements for authorization.) Following authorization, EPA retains enforcement authority under sections 3007, 3008, 3013, and 7003 of RCRA, although authorized States have primary enforcement responsibility.

Before the Hazardous and Solid Waste Amendments of 1984 (HSWA) amended RCRA, a State with final authorization administered its hazardous waste program entirely in lieu of the Federal program in that State. The Federal requirements no longer applied in the authorized State, and EPA could not issue permits for any facilities located in the State with permitting authorization. When new, more stringent Federal requirements were promulgated or enacted, the State was obligated to enact equivalent authority within specified time-frames. New Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law.

By contrast, under section 3006(g) of RCRA, 42 U.S.C. 6926(g), new requirements and prohibitions imposed by the HSWA (including the hazardous waste listings finalized in this notice) take effect in authorized States at the same time that they take effect in non-authorized States. While States must still adopt HSWA-related provisions as State law to retain final authorization, EPA is directed to implement those requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so.

Authorized States are required to modify their programs only when EPA promulgates Federal standards that are more stringent or broader in scope than existing Federal standards. Section 3009 of RCRA allows States to impose standards more stringent than those in the Federal program. See also 40 CFR 271.1(I). For those Federal program changes, both HSWA and non-HSWA, that are less stringent or reduce the scope of the Federal program, States are not required to modify their programs. Less stringent regulations, both HSWA and non-HSWA, do not go into effect in authorized States until those States adopt them and are authorized to implement them.

B. How Would This Rule Affect State Authorization?

We are proposing today's rule pursuant to HSWA authority. The listing of the new K-wastes is promulgated pursuant to RCRA section 3001(e)(2), a HSWA provision. Therefore, we are adding this rule to Table 1 in 40 CFR 271.1(j), which identifies the Federal program requirements that are promulgated pursuant to HSWA and take effect in all States, regardless of their authorization status. The land disposal restrictions for these wastes are promulgated pursuant to RCRA section 3004(g) and (m), also HSWA provisions. Table 2 in 40 CFR 271.1(j) is modified to indicate that these requirements are self-implementing. States may apply for either interim or final authorization for the HSWA provisions in 40 CFR 271.1(j), as discussed below. Until the States receive authorization for these more stringent HSWA provisions, EPA would implement them.

A State submitting a program modification for the portions of this proposed rule promulgated pursuant to

HSWA authority could apply to receive either interim authorization under RCRA section 3006(g) or final authorization under 3006(b), if the State requirements are, respectively, substantially equivalent or equivalent to EPA's requirements. States can only receive final authorization for program modifications implementing non-HSWA requirements. The procedures and schedule for final authorization of State program modifications are described in 40 CFR 271.21. It should be noted that all HSWA interim authorizations are currently scheduled to expire on January 1, 2003 (see 57 FR 60129, February 18, 1992).

Section 271.21(e)(2) of EPA's State authorization regulations (40 CFR part 271) requires that States with final authorization modify their programs to reflect Federal program changes and submit the modifications to EPA for approval. The deadline by which the States would need to modify their programs to adopt this proposed regulation is determined by the date of promulgation of a final rule in accordance with section 271.21(e)(2). Table 1 at 40 CFR 271.1 is amended accordingly. Once EPA approves the modification, the State requirements would become RCRA Subtitle C requirements.

States with authorized RCRA programs already may have regulations similar to those in this proposed rule. These State regulations have not been assessed against the Federal regulations being finalized to determine whether they meet the tests for authorization. Thus, a State would not be authorized to implement these regulations as RCRA requirements until State program modifications are submitted to EPA and approved, pursuant to 40 CFR 271.21. Of course, States with existing regulations that are more stringent than or broader in scope than current Federal regulations may continue to administer and enforce their regulations as a matter of State law. In implementing the HSWA requirements, EPA will work with the States under agreements to avoid duplication of effort.

C. Who Would Need to Notify EPA That They Have a Hazardous Waste?

Under RCRA Section 3010, the Administrator may require all persons who handle hazardous wastes to notify EPA of their hazardous waste management activities within 90 days after the wastes are identified or listed as hazardous. This requirement may be applied even to those generators, transporters, and treatment, storage, and disposal facilities (TSDFs) that have previously notified EPA with respect to the management of other hazardous wastes. The Agency is proposing to waive this notification requirement for persons who handle wastes that are covered by today's listings and have already (1) notified EPA that they manage other hazardous wastes, and (2) received an EPA identification number. However, any person who generates, transports, treats, stores, or disposes of these wastes and has not previously received an EPA identification number would need to obtain an identification number pursuant to 40 CFR 262.12 to generate, transport, treat, store, or dispose of these hazardous wastes 90 days after the effective date.

D. What Would Generators and Transporters Have to Do?

Once a final rule is promulgated, persons that generate newly identified hazardous wastes may be required to obtain an EPA identification number if they do not already have one (as discussed above). In order to be able to generate or transport these wastes after the effective date of this rule, generators of the wastes listed today would be subject to the generator requirements set forth in 40 CFR part 262. These requirements include standards for hazardous waste determination (40 CFR 262.11), compliance with the manifest (40 CFR 262.20 to 262.23), pretransport procedures (40 CFR 262.30 to 262.34), generator accumulation (40 CFR 262.34), record keeping and reporting (40 CFR 262.40 to 262.44), and import/export procedures (40 CFR 262.50 to 262.60). The generator accumulation provisions of 40 CFR 262.34 allow generators to accumulate hazardous wastes without obtaining interim status or a permit only in units that are container storage units or tank systems. These existing regulations also place a limit on the maximum amount of time that wastes can be accumulated in these units. If, however, the wastes covered in today's proposed rule are managed in units that are not tank systems or containers, then these units would be subject to the permitting requirements of 40 CFR parts 264 and 265, and the generator is required to obtain interim status and seek a permit (or modify interim status or a permit, as appropriate). Also, current regulations require that persons who transport newly identified hazardous wastes to obtain an EPA identification number as described above; such transporters will be subject to the transporter requirements set forth in 40 CFR part 263.

E. Which Facilities Would Be Subject to Permitting?

1. Facilities Newly Subject to RCRA Permit Requirements

Facilities that treat, store, or dispose of wastes that are subject to RCRA regulation for the first time by this proposed rule (that is, facilities that have not previously received a permit pursuant to Section 3005 of RCRA and are not currently operating pursuant to interim status), could be eligible for interim status (see section 3005(e)(1)(A)(ii) of RCRA). To obtain interim status based on treatment, storage, or disposal of such newly identified wastes, eligible facilities would be required to comply with 40 CFR 270.70(a) and 270.10(e) by providing notice under section 3010 and submitting a Part A permit application no later than 6 months after date of publication of the final rule. Such facilities would be subject to regulation under 40 CFR part 265 until a permit is issued.

In addition, under Section 3005(e)(3) and 40 CFR 270.73(d), not later than 6 months after date of publication of the final rule, land disposal facilities newly qualifying for interim status under section 3005(e)(1)(A)(ii) would also need to submit a Part B permit application and certify that the facility is in compliance with all applicable groundwater monitoring and financial responsibility requirements. If the facility fails to submit these certifications and a permit application, then interim status would terminate on that date.

2. Existing Interim Status Facilities

Pursuant to 40 CFR 270.72(a)(1), all existing hazardous waste management facilities (as defined in 40 CFR 270.2) that treat, store, or dispose of the newly identified hazardous wastes and are currently operating pursuant to interim status under section 3005(e) of RCRA, would need to file an amended Part A permit application with EPA no later than six months after date of publication of a final rule. By doing this, the facility could continue managing the newly listed wastes. If the facility fails to file an amended Part A application by that date, the facility would not receive interim status for management of the newly listed hazardous wastes and may not manage those wastes until the facility receives either a permit or a change in interim status allowing such activity (40 CFR 270.10(g)).

3. Permitted Facilities

Facilities that already have RCRA permits would need to request permit modifications if they want to continue managing newly listed wastes (see 40 CFR 270.42(g)). This provision states that a permittee may continue managing the newly listed wastes by following certain requirements, including submitting a Class 1 permit modification request by the date on which the waste or unit becomes subject to the new regulatory requirements (i.e., the effective date of a final rule), complying with the applicable standards of 40 CFR parts 265 and 266 and submitting a Class 2 or 3 permit modification request within 180 days of the effective date.

Generally, a Class 2 modification is appropriate if the newly listed wastes will be managed in existing permitted units or in newly regulated tank or container units and will not require additional or different management practices than those authorized in the permit. Please note that under this proposal, liquids managed in tanks or containers would only become newly listed waste if they meet the listing description for constituent concentration levels and if they are not managed solely in tanks and containers and then discharged directly from a POTW or centralized wastewater treatment facility. A Class 2 modification requires the facility owner to provide public notice of the modification request, a 60-day public comment period, and an informal meeting between the owner and the public within the 60-day period. The Class 2 process includes a ''default provision,'' which provides that if the Agency does not reach a decision within 120 days, the modification is automatically authorized for 180 days. If the Agency does not reach a decision by the end of that period, the modification is permanently authorized (see 40 CFR 270.42(b)).

A Class 3 modification is generally appropriate if management of the newly listed wastes requires additional or different management practices than those authorized in the permit or if newly regulated land-based units are involved. The initial public notification and public meeting requirements are the same as for Class 2 modifications. However, after the end of the 60-day public comment period, the Agency will grant or deny the permit modification request according to the more extensive procedures of 40 CFR part 124. There is no default provision for Class 3 modifications (see 40 CFR 270.42(c)).

Under 40 CFR 270.42(g)(1)(v), for newly regulated land disposal units, permitted facilities must certify that the facility is in compliance with all applicable 40 CFR Part 265 groundwater monitoring and financial responsibility requirements no later than 6 months after the date of publication of a final rule. If the facility fails to submit these certifications, authority to manage the newly listed wastes under 40 CFR 270.42(g) will terminate on that date.

For states which have not yet picked up the permit modification tables of 40 CFR 270.42, ''major'' and ''minor'' permit modifications should be applied as appropriate to the permit modification request.

4. Units

Units in which newly identified hazardous wastes are generated or managed would be subject to all applicable requirements of 40 CFR part 264 for permitted facilities or 40 CFR part 265 for interim status facilities, unless the unit is excluded from such permitting by other provisions, such as the wastewater treatment tank exclusions (40 CFR 264.1(g)(6) and 265.1(c)(10)) and the product storage tank exclusion (40 CFR 261.4(c)). Examples of units to which these exclusions could never apply include landfills, waste piles, incinerators, and any other miscellaneous units in which these wastes may be generated or managed.

5. Closure

All units in which newly identified hazardous wastes are treated, stored, or disposed after the effective date of this regulation that are not excluded from the requirements of 40 CFR parts 264 and 265 would be subject to both the general closure and post-closure requirements of subpart G of 40 CFR parts 264 and 265 and the unit-specific closure requirements set forth in the applicable unit technical standards subpart of 40 CFR part 264 or 265 (e.g., Subpart N for landfill units). In addition, EPA promulgated a final rule that allows, under limited circumstances, regulated landfills or surface impoundments to cease managing hazardous waste, but to delay Subtitle C closure to allow the unit to continue to manage nonhazardous waste for a period of time prior to closure of the unit (see 54 FR 33376, August 14, 1989). Units for which closure is delayed continue to be subject to all applicable 40 CFR parts 264 and 265 requirements. Dates and procedures for submittal of necessary demonstrations, permit applications, and revised applications are detailed in 40 CFR 264.113(c) through (e) and 265.113(c) through (e).

VIII. CERCLA Designation and Reportable Quantities

A. What Is the Relationship Between RCRA and CERCLA?

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act of 1980) defines the term ''hazardous substance'' to include RCRA listed and characteristic hazardous wastes. When EPA adds a hazardous waste under RCRA, the Agency also will add the waste to its list of CERCLA hazardous substances. EPA establishes a reportable quantity, or RQ, for each CERCLA hazardous substance. EPA provides a list of the CERCLA hazardous substances along with their RQs in Table 302.4 at 40 CFR 302.4. If you are the person in charge of a vessel or facility that releases a CERCLA hazardous substance in an amount that equals or exceeds its RQ, then you must report that release to the National Response Center (NRC) pursuant to CERCLA Section 103. You also may have to notify State and local authorities.

B. How Does EPA Determine Reportable Quantities?

Under CERCLA, all new hazardous substances automatically have a statutory one-pound RQ. EPA adjusts the RQ of a newly added hazardous substance based on an evaluation of its intrinsic physical, chemical, and toxic properties. These intrinsic properties—called ''primary criteria''—are aquatic toxicity, mammalian toxicity (oral, dermal, and inhalation), ignitability, reactivity, chronic toxicity, and potential carcinogenicity. EPA evaluates the data for a hazardous substance for each primary criterion. To adjust the RQs, EPA ranks each criterion on a scale that corresponds to an RQ value of 1, 10, 100, 1,000, or 5,000 pounds. For each criterion, EPA establishes a tentative RQ. A hazardous substance may receive several tentative RQ values based on its particular intrinsic properties. The lowest of the tentative RQs becomes the ''primary criteria RQ'' for that substance.

After the primary criteria RQs are assigned, EPA further evaluates substances for their susceptibility to certain degradative processes. These are secondary adjustment criteria. The natural degradative processes are biodegradation, hydrolysis, and photolysis (BHP). If a hazardous substance, when released into the environment, degrades rapidly to a less hazardous form by one or more of the BHP processes, EPA generally raises its RQ (as determined by the primary RQ adjustment criteria) by one level. Conversely, if a hazardous substance degrades to a more hazardous product after its release, EPA assigns an RQ to the original substance equal to the RQ for the more hazardous substance.

The standard methodology used to adjust the RQs for RCRA hazardous waste streams differs from the methodology applied to individual hazardous substances. The procedure for assigning RQs to RCRA waste streams is based on the results of an analysis of the hazardous constituents of the waste streams. The constituents of each RCRA hazardous waste stream are identified in 40 CFR part 261, Appendix VII. EPA first determines an RQ for each hazardous constituent within the waste stream using the methodology described above. The lowest RQ value of these constituents becomes the adjusted RQ for the waste stream. When there are hazardous constituents of a RCRA waste stream that are not CERCLA hazardous substances, the Agency develops an RQ, called a ''reference RQ,'' for these constituents in order to assign an appropriate RQ to the waste stream (see 48 FR 23565, May 25, 1983). In other words, the Agency derives the RQ for waste streams based on the lowest RQ of all of the hazardous constituents, regardless of whether they are CERCLA hazardous substances.

C. Is EPA Proposing to Adjust the Statutory One Pound RQ for These Wastes?

In today's proposed rule, EPA is proposing to assign 100-pound adjusted RQs to the K179 and K180 wastes. The RQs for each of the constituents contained in the two proposed wastes are presented in the table below.[46]

TABLE VIII.C–1.—PROPOSED RQS FOR CONSTITUENTS IDENTIFIED IN K179 AND K180 WASTES

Constituents in K179 & K180 waste streams	Constituent RQ (lbs.) (40 CFR 302.4)
Acrylonitrile	100
Acrylamide	5000
Antimony	5000
N-butyl alcohol	5000
Methylene chloride (dichloromethane)	1000
Formaldehyde	100
Ethylbenzene	1000
Methyl isobutyl ketone	5000
Methyl methacrylate	1000
Styrene	1000
Toluene	1000
Xylene	1000

[46] We are considering an alternative proposal not to list paint manufacturing waste liquids (see Section IV.D). If we do not list wastes under K180, then there would be no need to promulgate adjusted RQs for the following constituents: n-butyl alcohol, methylene chloride, formaldehyde, ethylbenzene, styrene, toluene, and xylene.

D. How Would a Concentration-Based Hazardous Waste Listing Approach Relate to My Reporting Obligations Under CERCLA? When Would I Need To Report a Release of These Wastes Under CERCLA?

Today's proposed hazardous waste listings are based on the concentrations of the hazardous constituents in the wastes. Adjusted RQs of 100 pounds are being proposed for these wastes based on the lowest RQ of the hazardous constituents in the wastes. Notification is required under CERCLA when wastes meeting the listing descriptions are released into the environment in a quantity that equals or exceeds the RQ for the waste.

For CERCLA reporting purposes, the Clean Water Act mixture rule (40 CFR 302.6) applies to releases of these wastes when the quantity (or concentrations) of all of the hazardous constituents in the waste are known. In such a case, notification is required where an amount of waste is released that contains an RQ or more of any hazardous substance contained in the waste. When the quantity (or concentration) of one or more of the hazardous constituents is not known, notification is required when the quantity of waste released equals or exceeds the RQ for the waste stream.

Although today's proposed hazardous waste listings are based on the concentrations of the hazardous constituents in the wastes, the Agency recognizes that it may not be necessary for a generator of these wastes to learn the concentrations of every hazardous constituent in the wastes in order to determine whether one of the listing descriptions applies. This is because a waste stream need exceed only one of the constituent-specific regulatory levels to meet one of the listing descriptions. Moreover, many generators, after testing their waste streams initially, may use knowledge of the waste, or of the process generating the waste, to determine that their waste is or is not hazardous under 40 CFR 262.11. Today's proposed rule requires sampling and analysis only for large-volume generators of the proposed waste streams. Therefore, many smaller generators may not know the concentrations of the constituents in their wastes. For these reasons, EPA believes that many, if not a majority, of the generators of these wastes may not know the concentrations of every constituent in these wastes, and may not, therefore, be able to apply the mixture rule.

E. How Would I Report a Release?

To report a release of proposed K179 or K180 (or any other CERCLA hazardous substance) that equals or exceeds its RQ, you would need to immediately notify the National Response Center (NRC) as soon as you have knowledge of that release. The toll-free telephone number of the NRC is 1–800–424–8802; in the Washington, DC, metropolitan area, the number is (202) 267–2675.

You could also need to notify State and local authorities. The Emergency Planning and Community Right-to-Know Act (EPCRA) requires that owners and operators of certain facilities report releases of CERCLA hazardous substances and EPCRA extremely hazardous substances (see list in 40 CFR part 355, appendix A) to State and local authorities. After the release of an RQ or more of any of those substances, you must report immediately to the community emergency coordinator of the local emergency planning committee for any area likely to be affected by the release, and to the State emergency response commission of any State likely to be affected by the release.

F. What Is the Statutory Authority for This Program?

Section 101(14) of CERCLA defines the term hazardous substance by referring to substances listed under several other environmental statutes, as well as those substances that EPA designates as hazardous under CERCLA section 102(a). In particular, CERCLA section 101(14)(C) defines the term hazardous substance to include ''any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act.'' CERCLA section 102(a) gives EPA authority to establish RQs for CERCLA hazardous substances. CERCLA section 103(a) requires any person in charge of a vessel or facility that releases a CERCLA hazardous substance in an amount equal to or greater than its RQ to report the release immediately to the federal government. EPCRA section 304 requires owners or operators of certain facilities to report releases of CERCLA hazardous substances and EPCRA extremely hazardous substances to State and local authorities.

G. How Can I Influence EPA's Thinking on Regulating K179 and K180 Under CERCLA?

In developing this proposal, EPA tried to address the concerns of all our stakeholders. Your comments will help us to improve this proposal. We invite you to provide your views on this proposal and how it may affect you. We also are interested in receiving any comments that you have on the information provided in Table VIII.C–1, including the hazardous constituents identified for proposed K179 and K180 and the maximum observed concentrations for each constituent.

IX. Analytical And Regulatory Requirements

A. Is This a Significant Regulatory Action Under Executive Order 12866?

Under Executive Order 12866, EPA must determine whether a regulatory action is significant and, therefore, subject to comprehensive review by the Office of Management and Budget (OMB), and the other provisions of the Executive Order. A significant regulatory action is defined by the Order as one that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or rights and obligations or recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in Executive Order 12866.

OMB has determined that today's proposed rule is a ''significant regulatory action,'' because it may raise novel legal or policy issues. As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

Based on the results of our economic analysis of the proposed rule, we believe that the annual economic effects of this proposed rule do not meet the requirements for an economically significant regulatory action (see point one above). On the national level, the annual compliance costs of this rule, as proposed, are estimated to be less than $100 million. We are unable to quantify the benefits of the proposed rule, but anticipate that such benefits would also be less than $100 million. Furthermore, we do not expect this proposed rule to adversely affect, in a material way, the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities.

We have prepared two economic support documents for this proposed action. These are: Economic Assessment for the Proposed Concentration-Based Listing of Wastewaters and Non-Wastewaters from the Production of Paints and Coatings, and, Regulatory Flexibility Screening Analysis for the Proposed Concentration-Based Listing of Wastewaters and Non-Wastewaters from the Production of Paints and Coatings. The Economic Assessment addresses, among other elements, compliance costs to the regulated community, industry economic impacts, qualitative benefits, children's health, unfunded mandates, regulatory takings, federalism, and environmental justice. The Regulatory Flexibility Screening Analysis (RFSA) examines impacts to small entities that may result from this action, as proposed. These analyses cover not only the impacts on the paint industry, but also the potential impacts on land disposal facilities that have disposed of the wastes considered in this rulemaking. Because of the proposed listing, leachate from these landfills may be hazardous under the Derived-from Rule. Also, when the leachate from these two wastes mixes with leachate from other wastes disposed in these landfills the entire leachate quantity may be considered hazardous under the Mixture Rule. A summary of findings from this Economic Assessment is presented directly below. The RFSA is summarized in Part B of this Section. The complete Economic Assessment and RFSA documents are available in the RCRA docket established for this action.

Paint manufacturers produce varnishes, lacquers, enamels and shellac, putties, wood fillers and sealers, paint and varnish removers, paint and brush cleaners, and allied products. The products are produced for four end-use markets: architectural coatings, product finishes for original equipment manufacturers, special purpose coatings, and allied paint products. According to Census data for 1997 there are approximately 1,495 facilities in operation in the U.S., owned by 1,206 different companies. Total production is estimated to range from 1.2 billion and 1.5 billion gallons per year between 1992 and 1998, with a total product value of $17.2 billion in 1998. This industry segmentation includes all facilities identified in Standard Identification Classification (SIC) 2851 and under the North American Industrial Classification (NAICS) code 325510; this includes some manufacturers of miscellaneous allied paint products which will not be impacted by the proposed rule.

Approximately 1,146, or 95 percent of the paint manufacturing companies in the U.S. are estimated to be small according to the Small Business Administration (SBA) definition for small (fewer than 500 employees) based on corporate level data.[47] Many of these facilities (and companies) are very small, with fewer than ten full-time employees.

While the Census of Manufacturers identifies 1,495 facilities, not all of these facilities are actually paint manufacturers potentially affected by the proposed waste listing. The Agency has estimated, using a RCRA 3007 survey of the industry, that there are 972 facilities that manufacture paints and coatings in the U.S. Of this total, we estimate that 615 facilities operated by 494 companies generate the waste streams of concern for this proposed listing. On the basis of the extrapolated survey, we estimate that these facilities generate nearly 107,000 metric tons of the targeted waste streams (K179 and K180), of which about 36 percent is currently managed as hazardous waste. This analysis relies primarily on data generated through the Agency's survey of the industry, augmenting this information with Census and other industry specific information as appropriate.

We have developed impact estimates for the concentration-based listing proposal (the Agency's preferred approach) and two key options: A no-list or status quo option and a traditional or standard listing approach option. Under the proposed approach, we also evaluated two alternative scenarios: A nonwastewaters option which limits the listing to waste solids (K179) and a sensitivity analysis scenario where wastes currently going to hazardous fuel blending and cement kilns would be diverted to a commercial hazardous waste incinerator.

[47] Small Business Size Standards—Matched to North American Industrial Classification System (NAICS) Codes, Effective October 1, 2000, Small Business Administration (SBA)

A supplementary analysis of our RCRA 3007 survey data shows that an estimated 50 percent of the nonwastewaters and 20 percent of the wastewaters generated by survey respondents did not contain any of the constituents of concern. We used these ratios for our analysis of the percentage of wastes that would be listed hazardous waste for the concentration-based listing approach (the Agency's proposed option), e.g., 50 percent of nonwastewaters and 80 percent of wastewaters would become hazardous. Our findings under this approach may overestimate compliance costs for waste streams containing listed constituents that fall below risk-based concentration levels. We assumed that one-hundred percent of all targeted wastes were designated as hazardous under the aggregate findings for the traditional or standard listing option.

The estimated impacts associated with the Agency proposed approach, alternative scenarios to the proposed approach, and alternative waste listing options are presented in the table below. As indicated, we estimate that the nonwastewaters scenario under the proposed approach is the least costly, at $6.7 million per year for all impacted facilities. Our proposed approach has estimated annual costs of $7.3 million per year, or $600,000 more than the nonwastewaters scenario. If we assume that the wastes currently going to hazardous waste fuel blending will be diverted to commercial incinerators (the sensitivity analysis) we estimate aggregate cost of $18.1 million per year. The traditional or standard listing option is estimated to cost $10.9 million per year. The no-list or status quo option would result in no incremental costs to industry. The impact estimates in Table IX.A–1 are fully weighted to account for model facility representation. These figures (except the Traditional Option) also assume baseline conditions where 50 percent of the nonwastewaters and 20 percent of the wastewaters are nonhazardous, as managed under the proposed waste listing option.

TABLE IX.A–1.—SUMMARY OF ESTIMATED IMPACTS FROM ALL WASTE LISTING OPTIONS AND SCENARIOS

Listing option/scenario	Average weighted incremental annual cost as a percent of gross annual sales	Aggregate annual compliance cost impacts (million 1999 dollars)
Proposed Concentration-Based Listing—Agency Preferred Approach (APA)	0.07	[1] 7.3
Agency Preferred Approach-Sensitivity Analysis Scenario (APA 1) (Waste going to all fuel blending is diverted to commercial incineration)	0.19	18.1
Agency Preferred Approach—List Solids (K179) Only (APA 2)	0.06	6.7
Traditional or Standard Listing Option	0.10	[1] 10.9
No List—Status Quo Option	0.0	0.0

[1] While cost estimates under the APA represent only 50 percent of total nonhazardous solids and 80 percent of the nonhazardous liquids, aggregate impacts do not directly reflect this difference. The unweighted and unscaled waste management costs under the APA are estimated at $1.8 million. The unweighted and unscaled waste management costs under the Traditional Listing Option are estimated at $3.5 million. Applying the weighting and scaling factors, plus transportation, administrative, and analytical (APA only) costs results in aggregate annual nationwide compliance costs of $7.3 million for the APA and $10.9 million for the Traditional Option.

In addition to the costs presented above, incremental costs expected to be incurred by the landfill industry are estimated to be approximately $300,000 to $400,000 annually for the proposed option (The Clean Water Act Exemption with Two-Year Impoundment Replacement Deferral regulatory option). However, the costs may be considerably lower as the result of possible savings gained through contract negotiations for repeat customers who provide consistent revenue streams to shipping companies through their regularly scheduled shipments of leachate. It also is likely that not all landfills that received paint wastes prior to this proposed action have leachate collection systems, which would lower the cost estimates. Finally, there is likely some overlap from paint facilities disposing in the same landfill, which will result in lower costs to the landfill industry.

Table IX.A–2 presents impacts for different size classes of the model facilities, based on employment. The impacts presented in this table represent the impacts on the facilities associated with the proposed waste listing approach (APA). However, these figures assume that 100 percent of all of the waste generated is hazardous, as a high-end scenario. In general, cost impacts as a percent of sales are modest, averaging just over 0.1 percent of gross annual revenues. For three of the 151 ''model facilities,'' impacts exceed 1.0 percent of gross sales; these three model facilities are estimated to represent six total facilities. (The reader should note these findings are at the facility, not the company or parent firm level.)

TABLE IX.A–2.—ESTIMATED COST IMPACTS ON MODEL FACILITIES FROM THE AGENCY PREFERRED LISTING APPROACH

Model facility size range (number of employees per facility)	Estimated 1999 average annual gross sales (thousand dollars)	Unweighted incremental cost range per facility* (percent of gross annual sales)	Average unweighted incremental cost as a percent of sales*
1–19	3,661	0.04–3.77	0.11
20–49	11,484	0.01–0.50	0.05
50–149	31,839	0.01–4.06	0.11

TABLE IX.A–2.—ESTIMATED COST IMPACTS ON MODEL FACILITIES FROM THE AGENCY PREFERRED LISTING APPROACH—Continued

Model facility size range (number of employees per facility)	Estimated 1999 average annual gross sales (thousand dollars)	Unweighted incremental cost range per facility* (percent of gross annual sales)	Average unweighted incremental cost as a percent of sales*
150 & Above	85,791	0.01–1.33	0.17

*Estimates derived assuming 100 percent of all waste streams generated by the model facilities are hazardous.

The proposed rule is intended to reduce the potential for environmental releases of hazardous wastes. Depending on current and future exposure patterns, the proposed rule could yield benefits in terms of reductions in health risks due to stricter controls on the management of this waste. The Agency has not monetized or quantitatively estimated the human health or environmental benefits, but anticipates that such benefits would be less than $100 million. Furthermore, additional data are necessary to determine whether there will be net benefits (i.e., benefits exceeding costs) from the proposed rule.

B. What Consideration Was Given to Small Entities Under the Regulatory Flexibility Act (RFA), as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.?

Introduction

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute, unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of rules on small entities, a small entity is defined as: (1) A small business that has fewer than 1000, 750, or 500 employees per firm depending upon the SIC code the firm is primarily classified in; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; or (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's proposed rule on small entities, we believe that this action should not have a significant economic impact on a substantial number of small entities. In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities, since the primary purpose of the regulatory flexibility analyses is to identify and address regulatory alternatives ''which minimize any significant economic impact of the proposed rule on small entities' (5 U.S.C. 603 and 604). Thus, an agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule.

We have completed a screening analysis (Regulatory Flexibility Screening Analysis for the Proposed Concentration-Based Listing of Wastewaters and Non-Wastewaters from the Production of Paints and Coatings), in support of today's proposed action. Findings from this Regulatory Flexibility Screening Analysis (RFSA), as described in the previous section above, suggest that today's rule, as proposed, will not result in significant economic impacts on a substantial number of small business paint manufacturers potentially subject to rule requirements.

Findings

Between 93 percent and 95 percent of all paint and coatings manufacturing companies are estimated to be ''small,'' based on the SBA definition. Census data from 1997 indicate a total of 95 percent are small companies, while our research based on the RCRA 3007 survey data on 1998 practices and research on representative companies indicate approximately 91 percent of all companies may be small. An average of these sources indicates approximately 93 percent, or 460 out of the total of 494 different companies operating 615 facilities potentially subject to rule requirements may be considered small for purposes of this analysis. We have determined that paint manufacturing facilities are not owned or operated by small (or large) entities (not-for-profits, local governments, tribes, etc.), other than businesses.

We estimate that, under the proposed regulatory option, impacts on small companies would average about 0.06 percent of annual gross revenues. Three small companies (operating four facilities) out of the total of 460 small companies potentially subject to rule requirements were found to experience annual compliance cost impacts greater than 1.0 percent of annual gross revenues. We also examined potential economic impacts to small businesses under three alternative regulatory options. Impacts to small businesses under these options all averaged less than 0.5 percent of annual gross revenues.

The Agency is required to make an initial determination if any regulatory action may have a ''significant economic impact on a substantial number of small entities,'' as required by the RFA as amended by SBREFA. However, the legislation presents no explicit guidelines regarding what constitutes a significant impact or what constitutes a significant number of small entities for this particular industry. Based on a review of overall impacts we believe that the impacts on small entities, as estimated in this report, should not be considered ''significant.'' It is also anticipated that the industry will pass at least some of these costs on in the form of higher paint prices, thereby reducing the actual effect on individual small entities.

The paint and coatings industry is dominated by small entities, at least in terms of number of facilities. Accordingly it may be argued that there could be a substantial number of small entities impacted. However it appears that the impacts on these small entities are modest, especially compared with large facilities, as illustrated in Table IX.B–3 below.

TABLE IX.B–3.—SUMMARY OF ESTIMATED IMPACTS FROM ALL WASTE LISTING OPTIONS SMALL AND LARGE FACILITIES *

Listing option	Entity size	Number of unweighted model facilities **	Average incremental cost as a percent of sales	Aggregate annual cost impacts (million 1999$/year)
No List Option	Large	14	0.00	0.0
	Small	137	0.00	0.0
Traditional or Standard Listing	Large	14	0.16	3.6
	Small	137	0.08	7.4
Agency Preferred Approach (APA)	Large	14	0.09	2.1
	Small	137	0.06	5.2
Agency Preferred Approach (Sensitivity Analysis Scenario APA1)	Large	14	0.42	9.4
	Small	137	0.11	8.7
Agency Preferred Approach (Scenario to List Solids Only APA2)	Large	14	0.09	2.0
	Small	137	0.05	4.7

* Large entities include all facilities which could be identified as being owned by companies with more than 500 employees. The small entity category contains all other facilities.
** The estimated total number of small entities affected by the rule industry-wide is 572; there are an estimated 43 large entities affected.

Conclusions

After considering the above findings, I certify that this proposed action should not result in significant economic impacts on a substantial number of small paints and coatings manufacturing businesses subject to rule requirements. Furthermore, this rule, as proposed does not require further analysis and evaluation under a full Regulatory Flexibility Analysis. The RFSA document: Regulatory Flexibility Screening Analysis for the Proposed Concentration-Based Listing of Wastewaters and Non-Wastewaters from the Production of Paints and Coatings, is available for review in the docket established for today's action. Concerned stakeholders are encouraged to conduct a comprehensive review and evaluation of this document and provide non-restricted data and comments designed to improve this analysis.

C. What Consideration Was Given to Children's Health Under Executive Order 13045?

''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under E.O. 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. This proposed rule is not subject to the Executive Order because it is not economically significant as defined in E.O. 12866. Furthermore, the Agency does not have reason to believe that environmental health or safety risks addressed by this action present a disproportionate risk to children.

The topic of environmental threats to children's health is growing in regulatory importance as scientists, policy makers, and village leaders continue to recognize the extent to which children are particularly vulnerable to environmental hazards. Recent EPA actions have been in the forefront of addressing environmental threats to the health and safety of children. Today's proposed rule further reflects our commitment to mitigating environmental threats to all citizens, including children.

A few significant physiological characteristics are largely responsible for children's increased susceptibility to environmental hazards. First, children eat proportionately more food, drink proportionately more fluids, and breathe more air per pound of body weight than do adults. As a result, children potentially experience greater levels of exposure to environmental threats than do adults. Second, because children's bodies are still in the process of development, their immune systems, neurological systems, and other immature organs can be more easily and considerably affected by environmental hazards. The connection between these physical characteristics and children's susceptibility to environmental threats are reflected in the higher baseline risk levels for children.

Today's proposed rule is intended to reduce potential releases of hazardous wastes to the environment. Depending on current and future exposure patterns, any risks associated with such releases would also decrease. EPA considered risks to children in its risk assessment and set allowable concentrations for constituents in the waste at levels that are believed to be protective to children, as well as adults. The management practices proposed in this rule are intended to reduce the potential for unacceptable risks to children potentially exposed to the constituents of concern.

The public is invited to submit or identify peer-reviewed studies and data, of which the agency may not be aware, that assess results of early life exposure to the proposed hazardous constituents from paint manufacturing wastes addressed in this Proposal.

D. What Consideration Was Given to Environmental Justice Under Executive Order 12898?

Executive Order 12898, ''Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Population'' (February 11, 1994), is designed to address the environmental and human health conditions of minority and low-income populations. EPA is committed to addressing environmental justice concerns and has assumed a leadership role in environmental justice initiatives to enhance environmental quality for all citizens of the United States. The Agency's goals are to ensure that no segment of the population, regardless of race, color, national origin, income, or net worth bears disproportionately high and adverse human health and environmental impacts as a result of EPA's policies, programs, and activities. In response to Executive Order 12898, and to concerns voiced by many groups outside the Agency, EPA's Office of Solid Waste and Emergency Response (OSWER) formed an Environmental Justice Task Force to analyze the array of environmental justice issues specific to waste programs and to develop an overall strategy to identify and address these issues (OSWER Directive No. 9200.3–17).

We have assessed whether today's proposed rule may help mitigate, or result in disproportionate effects on minority or low-income populations. Due to budgeting and scheduling constraints, we have not compiled data correlating individual paint facility locations with minority/low income populations. However, our risk assessment did not identify risks from management of paint manufacturing waste liquids in tanks onsite at the paint manufacturing facility. Therefore, we believe that any populations in proximity to paint manufacturing facilities are not adversely affected by waste management practices within the purview of this proposal. This proposed listing is intended to reduce unacceptable risks associated with managing paint manufacturing wastes in nonhazardous waste landfills and in surface impoundments. This would reduce risks for any populations living in proximity to such facilities who rely on groundwater for drinking water supplies.

The affected paint manufacturing facilities, however, are distributed throughout the country and many are known to be located within highly urbanized areas. Furthermore, the waste management units in question are estimated, on average, to be located within 50 miles of the manufacturing facilities. Because the proposed rule would provide incentives for reducing the use of hazardous constituents and is intended to reduce environmental risks associated with the management of the targeted waste streams, the Agency believes that this rule could help mitigate health risks to minority and low income communities living near impacted facilities. Furthermore, we have no data indicating that today's proposal would result in disproportionately negative impacts on minority or low income communities.

E. What Consideration Was Given to Unfunded Mandates?

Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal Agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA must prepare a written analysis, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials to have meaningful and timely input in the development of regulatory proposals, and informing, educating, and advising small governments on compliance with the regulatory requirements.

This rule does not include a Federal mandate that may result in expenditures of $100 million or more to State, local, or tribal governments in the aggregate, because this rule imposes no enforceable duty on any State, local, or tribal governments. EPA also has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. In addition, as discussed above, the private sector is not expected to incur costs exceeding $100 million. Therefore, today's proposed rule is not subject to the requirements of sections 202, 203, and 205 of UMRA.

F. What Consideration Was Given to Federalism Under Executive Order 13132?

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' are defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under Section 6 of Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law, unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

Section 4 of the Executive Order contains additional requirements for rules that preempt State or local law, even if those rules do not have federalism implications (i.e., the rules will not have substantial direct effects on the States, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government). Those requirements include providing all affected State and local officials notice, and an opportunity for appropriate participation in the development of the regulation. If the preemption is not based on expressed or implied statutory authority, EPA also must consult, to the extent practicable, with appropriate State and local officials regarding the conflict between State law and federally protected interests within the agency's area of regulatory responsibility.

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This rule, as proposed, is projected to result in economic impacts to privately owned paint manufacturing facilities. Marginal administrative burden impacts may occur to selected States an/or EPA Regional Offices if these entities experience increased administrative needs, enforcement requirements, or voluntary information requests. However, this rule, as proposed, will not have substantial direct effects on the States, intergovernmental relationships, or the distribution of power and responsibilities. Thus, Executive Order 13132 does not apply to this rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, we specifically solicit comment on this proposed rule from State and local officials.

G. What Consideration Was Given to Tribal Governments Under Executive Order 13175: Consultation and Coordination With Indian Tribal Governments?

Executive Order 13175, ''Consultation and Coordination With Indian Tribal Governments,'' was signed by the President on November 6, 2000. As of January 6, 2001, Executive Order 13175 (65 FR 67249) took effect and revoked Executive Order 13084. Please note that we addressed tribal considerations under Executive Order 13084 because we developed this proposed rule during the period when this Order was in effect. We will analyze and fully comply with the requirements of Executive Order 13175 before promulgating the final rule.

This Order applies to regulations not specifically required by statute that significantly or uniquely affect the communities of Indian tribal governments, and that impose substantial direct compliance costs on Indian tribal governments. If any rule is projected to result in significant direct costs to Indian tribal communities, EPA cannot issue this rule unless the Federal government provides funds necessary to pay the direct costs incurred by the Indian tribal government or the tribe, or consults with the appropriate tribal government officials early in the process of developing the proposed regulation.

If EPA complies by consulting, we must provide the Office of Management and Budget (OMB) with all required information. We must also summarize, in a separately identified section of the preamble to the proposed or final rule, a description of the extent of our prior consultation with representatives of affected tribal governments, a summary of their concerns, and a statement supporting the need to issue the regulation. Also, Executive Order 13175 requires EPA to develop an effective process permitting elected and other representatives of Indian tribal governments to, ''provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.''

Today's rule implements mandates specifically and explicitly set forth by the U.S. Congress. This action is proposed under the authority of sections 3001(b)(1), and 3001(e)(2) of the Hazardous and Solid Waste Amendments (HSWA) of 1984. These sections direct EPA to make a hazardous waste listing determination for ''paint production wastes.'' Accordingly, the requirements of Executive Order 13175 do not apply to this rule.

Furthermore, today's proposal would not significantly or uniquely affect the communities of Indian tribal governments, nor would it impose substantial direct compliance costs on them. Tribal communities are not known to own or operate any paint/coatings manufacturing facilities, nor are these communities disproportionately located adjacent to or near such facilities. Finally, tribal governments will not be required to assume any administrative or permitting responsibilities associated with this proposed rule.

X. Paperwork Reduction Act (PRA), 5 U.S.C. 3501–3520

A. How is the Paperwork Reduction Act Considered in Today's Proposed Rule?

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared (ICR No. 2006.01) and a copy may be obtained from Sandy Farmer by mail at Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW, Washington, DC 20460, by email at farmer.sandy@epamail.epa.gov, or by calling (202) 260–2740. A copy may also be downloaded off the internet at *http://www.epa.gov/icr.*

This rule is proposed under the authority of sections 3001(e)(2) and 3001(b)(1) of the Hazardous and Solid Waste Amendments (HSWA) of 1984. The effect of listing the wastes described earlier will be to subject industry to management and treatment standards under the Resource Conservation and Recovery Act (RCRA).

This proposed concentration-based listing is designed to be self-implementing. Under this proposed approach, generators of the K179 and/or K180 wastes must determine if their waste is nonhazardous. This determination will ensure that concentration levels of the constituents of concern in the targeted wastes are below the regulatory levels. As a result, this rule, as proposed, represents only an incremental increase in burden for generators and subsequent handlers of the newly listed wastes in complying with existing RCRA information collection requirements.

The total annual respondent burden and cost for all paperwork associated with the proposed rule is represented by the new paperwork requirements for listing paint wastes, plus the incremental increase in paperwork burden under five existing Information Collection Requests (ICRs). We estimate the total annual respondent burden for all information collection activities to be approximately 8,361 hours, at an annual aggregate cost of approximately $639,747. Of the total respondent burden, only 1,457 hours per year, or 17.4 percent results from new paperwork requirements. The remaining 6,904 hour increase is derived from five existing paperwork requirements. These include: The Biennial Report, Generator Standards, Land Disposal restrictions, Manifest, and Notification.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose, or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install and use technology and systems for the purpose of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previous applicable instructions and requirements; train personnel to be able to respond to a collection of information; search new data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control number for EPA's regulations are listed in 40 CFR part 9, and 48 CFR Chapter 15.

Comments are requested on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques. Send comments on the ICR to the Director, Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW, Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th St., NW, Washington, DC 20503, marked ''Attention: Desk Officer for EPA.'' Include the ICR number in any correspondence. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after February 13, 2001, a comment to OMB is best assured of having its full effect if OMB receives it by March 15, 2001. The proposed rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

XI. National Technology Transfer and Advancement Act of 1995 (Pub L. 104–113, *12(d) (15 U.S.C. 272 Note))

A. Was The National Technology Transfer and Advancement Act Considered?

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This proposed rulemaking may involve voluntary consensus standards related to sampling and analysis procedures for waste characterization. Our implementation approach for waste characterization allows standard SW–846 methods, or appropriate alternatives. NTTAA does not apply to today's proposal because we are not requiring paint facilities to employ nonvoluntary consensus standards which they may deem as ''appropriate alternatives.''

List of Subjects

40 CFR Part 148

Administrative practice and procedure, Hazardous waste, Reporting and record keeping requirements, Water supply.

40 CFR Part 261

Environmental protection, Hazardous materials, Waste treatment and disposal, Recycling.

40 CFR Part 268

Environmental protection, Hazardous materials, Waste management, Reporting and record keeping requirements, Land Disposal Restrictions, Treatment Standards.

40 CFR Part 271

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous material transportation, Hazardous waste, Indians-lands, Intergovernmental relations, Penalties, Reporting and record keeping requirements, Water pollution control, Water supply.

40 CFR Part 302

Environmental protection, Air pollution control, Chemicals, Emergency Planning and Community Right-to-Know Act, Extremely hazardous substances, Hazardous chemicals, Hazardous materials, Hazardous materials transportation, Hazardous substances, Hazardous wastes, Intergovernmental relations, Natural resources, Reporting and record keeping requirements, Superfund, Waste treatment and disposal, Water pollution control, Water supply.

Dated: January 25, 2001.

W. Michael McCabe,

Acting Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is proposed to be amended as follows:

PART 148—HAZARDOUS WASTE INJECTION RESTRICTIONS

1. The authority citation for part 148 continues to read as follows:

Authority: Secs. 3004, Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*

2. Section 148.18 is amended by adding paragraphs (n) and (o) to read as follows:

§ 148.18 Waste specific prohibitions—newly listed and identified wastes.

* * * * *

(n) Effective [insert date six months after date of final rule], the wastes specified in 40 CFR 261.32 as EPA Hazardous Waste Numbers K179 and K180 are prohibited from underground injection.

(o) The requirements of paragraphs (a) through (n) of this section do not apply:

(1) If the wastes meet or are treated to meet the applicable standards specified in Subpart D of part 268 of this title; or

(2) If an exemption from a prohibition has been granted in response to a petition under subpart C of this part; or

(3) During the period of extension of the applicable effective date, if an extension has been granted under § 148.4 of this part.

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

3. The authority citation for part 261 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6922, 6924(y), and 6938.

4. Section 261.3 is amended by adding paragraph (c)(2)(ii)(F) to read as follows:

§ 261.3 Definition of hazardous waste.

* * * * *

(c) * * *

(2) * * *

(ii) * * *

(F) Treatment residues from paint manufacturing waste solids that met the K179 listing, when they are below the constituent concentration levels specified in the listing at § 261.32(b)(6)(iii) and a new hazardous waste determination is made following the procedures specified in § 261.32(b). These exempted treatment residues must still meet all requirements specified in part 268 of this chapter prior to land disposal.

5. Section 261.4 is amended by revising paragraph (b)(15) to read as follows.

§ 261.4 Exclusions.

* * * * *

(b) * * *

(15) Leachate or gas condensate collected from landfills where certain solid wastes have been disposed, provided that:

(i) The solid wastes disposed would meet one or more of the listing descriptions for Hazardous Waste Codes K169, K170, K171, K172, K174, K175, K179 and K180 if these wastes had been generated after the effective date of the listing;

(ii) The solid wastes described in paragraph (b)(15)(i) of this section were disposed prior to the effective date of the listing;

(iii) The leachate or gas condensate do not exhibit any characteristic of hazardous waste nor are derived from any other listed hazardous waste;

(iv) Discharge of the leachate or gas condensate, including leachate or gas condensate transferred from the landfill to a POTW by truck, rail, or dedicated pipe, is subject to regulation under sections 307(b) or 402 of the Clean Water Act.

(v) After [insert date 24 months from date of promulgation], leachate or gas condensate derived from K179 and/or K180 will no longer be exempt if it is stored or managed in a surface impoundment prior to discharge. There is one exception: if the surface impoundment is used to temporarily store leachate or gas condensate in response to an emergency situation (e.g., shutdown of wastewater treatment system), provided the impoundment has a double liner, and provided the leachate or gas condensate is removed from the impoundment and continues to be managed in compliance with the conditions of this paragraph after the emergency ends.

* * * * *

6. Section 261.32 is amended by designating the introductory text and the table as paragraph (a), and by amending the newly designated table by adding a new subgroup ''Paint Manufacturing'' and its entries at the end of the table and by adding paragraphs (b) and (c) to read as follows:

§ 261.32 Hazardous wastes from specific sources.

(a) * * *

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
*	* * * * *	*
Paint Manufacturing		
K179	K179—Paint manufactuirng waste solids generated by paint (T) manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph (b)(6)(iii) of this section at a concentration equal to or greater than the hazardous level set for that constitutent in paragraph (b)(6)(iiil) of this section. Paint manufacturing waste solids are: (1) waste solids generated from tank and equipment cleaning operations that use solvents, water and or caustic; (2) emission control dusts or sludges; (3) wastewater treatment sludges; and (4) off-specification product. Waste solids derived from the management of K180 by paint manufacturers would also be subject to this listing. Waste liquids derived from the management of K179 by paint manufacturers are not covered by this listing, but such liquids are subject to the K180 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph (b) of this section.	(T)
K180	Paint manufacturing waste liquids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph (b)(6)(iii) of this section at a concentration equal to or greater than the hazardous level set for that constituent in paragraph (b)(6)(iii) of this section unless the wastes are stored or treated exclusively in tanks or containers prior to discharge to a POTW or under a NPDES permit. Paint manufacturing liquids are generated from tank and equipment cleaning operations that use solvents, water, and/or caustic. Waste liquids derived from the management of K179 by paint manufacturers would also be subject to this listing. Waste solids derived from the management of K180 by paint manufacturers are not covered by this listing, but such solids are subject to the K179 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph (b) of this section.	(T)
*	* * * * *	*

* * * * *

(b) *Procedures for paint manufacturers to determine potential K179 and K180 wastes to be nonhazardous.* For purposes of § 261.32 the term ''paint manufacturing facility'' means a facility that produces paints (including undercoats, primers, finishes, sealers, enamels, refinish paints, and tinting bases), stains, varnishes (including lacquers), product finishes for original equipment manufacturing and industrial application, and, coatings (including special purpose coatings and powder coatings), but the term does not include a facility that exclusively produces miscellaneous allied products (including paint and varnish removers, thinners for lacquers or other solvent-based paint products, pigment dispersions or putty) or artist paints. The term also does not include a facility that exclusively prepares paint products (such as adding pigments to a tinting base) for sale to end users of the product. If you generate wastes that potentially fall within the K179 or K180 listing descriptions, you must use the waste analysis and handling procedures described below if you want to determine that your wastes are nonhazardous. If you have knowledge (e.g., knowledge of constituents in wastes based on existing sampling and analysis data and/or information about raw materials used, production processes used, and degradation products formed) to determine that the potential K179 or K180 wastes do not contain any of the constituents of concern identified for these types of wastes (see tables under paragraph (b)(6)(iii) of this section), you can use this knowledge, in lieu of the annual waste analysis requirements described in paragraph (b)(2)(ii) of this section, to make a nonhazardous determination.

(1) *Dilution Prohibition.* Prior to making a determination, you may only mix potential K179 wastes with other potential K179 wastes or potential K180 wastes with other potential K180 wastes, that is paint manufacturing wastes from tank and equipment cleaning operations that use solvents, water, and/or caustic; emission control dusts or sludges; wastewater treatment sludges and off specification product. You must not dilute potential K179 or K180 wastes with other waste or material before making a determination.

(2) *Determine annual waste analysis requirements.* If you generate paint manufacturing wastes that contain one or more constituents of concern, you must at least on an annual basis, use the following procedures to determine the waste analysis requirements for your wastes:

(i) You must either use the previous year's (previous 12 months) waste generation data, or, if these data are not available, estimate the total annual quantities of paint manufacturing waste solids and liquids that you will generate over the next 12 months based on current knowledge. You must determine total annual quantities separately for paint manufacturing waste solids and liquids, including the quantities of hazardous wastes (characteristic and otherwise listed) and nonhazardous wastes from tank and equipment cleaning operations that use solvents, water, and/or caustic; emission control dusts or sludges; wastewater treatment sludges and off specification product. Then, you must record the total annual waste quantities you expect to generate.

(ii) You must use the recorded total annual quantities of paint manufacturing waste solids and liquids to determine the appropriate annual waste analysis requirement for your wastes in accordance with the tiered approach described in the applicable table below. If you initially estimate that your waste generation would fall under the low volume tier, and, at any time within the 12 month period, the actual quantities of waste you generate fall within the upper volume tier, from that time, you would be subject to the upper tier waste analysis requirements. If you have not already tested your wastes, you must test your wastes. A new 12 month period to make a hazardous waste determination for your waste also starts when the actual quantity of your waste exceeds the expected lower volume tier limit.

TIERED WASTE ANALYSIS REQUIREMENTS FOR SOLIDS

Total annual quantity of hazardous and nonhazardous paint manufacturing waste solids	Annual waste analysis requirement
40 metric tons and less.	Test Wastes or Use knowledge of Wastes
Over 40 metric tons	Test Wastes

TIERED WASTE ANALYSIS REQUIREMENTS FOR LIQUIDS

Total annual quantity of hazardous and nonhazardous paint manufacturing waste liquids	Annual waste analysis requirement[1]
100 metric tons and less.	Test Wastes or Use Knowledge of Wastes
Over 100 metric tons	Test Wastes

[1] This requirement does not apply if the liquid wastes are stored or treated exclusively in tanks or containers and then sent to a POTW or discharged under a NPDES permit.

(3) *Nonhazardous determination for wastes based on testing.* If the total annual quantity of paint manufacturing wastes your facility generates exceeds 40 metric tons for waste solids or 100 metric tons for waste liquids, you must test the wastes according to the following procedures:

(i) You must develop a waste sampling and analysis plan (if there is no appropriate existing plan) to collect samples that are representative of the wastes.

(ii) At a minimum, the plan must include:

(A) A discussion on the number of samples representative of the wastes that are needed to fully characterize the wastes;

(B) The sampling method used to obtain samples representative of the wastes;

(C) A detailed description of the test method(s) used; and

(D) How the design of the sampling plan accounts for potential variability of the wastes.

(iii) You must test the wastes for each constituent of concern that is reasonably expected to be present in the wastes (see paragraph (b)(3)(iii)(B) of this section).

(A) The constituents of concern and listing concentration levels for the paint manufacturing waste solids and liquids are identified in paragraph (b)(6)(iii) of this section.

(B) From the list of constituents of concern for paint manufacturing waste solids or liquids, you must select the constituents of concern that are reasonably expected to be present in your wastes based on your knowledge of the wastes (e.g., knowledge of the constituents in the wastes based on existing sampling and analysis data and/or information about raw materials used, and degradation products formed).

(C) You must test for all constituents of concern that are reasonably expected to be present in the paint manufacturing wastes, regardless of their concentrations in the wastes.

(iv) You must conduct sampling and analysis in accordance with your waste sampling and analysis plan developed under paragraph (b)(3)(i) of this section.

(v) You may use any reliable analytical method to demonstrate that the concentrations of constituents of concern in the waste samples are not at or above the listing levels (see applicable list under paragraph (b)(6)(iii) of this section). It is your responsibility to ensure that the sampling and analysis are unbiased, precise, and representative of the wastes.

(vi) You must ensure that the measurements are sufficiently sensitive, accurate and precise to demonstrate that the maximum concentrations of the constituents of concern in any sample analyzed are not at or above the listing levels.

(vii) In an enforcement action, you, as the generator, bear the burden of proof to establish that the concentrations of constituents of concern in your wastes are below the listing levels. For wastes determined to be nonhazardous, compliance with the requirement that concentrations of constituents of concern are below the listing levels is based on grab sampling.

(viii) If all samples you test during any three consecutive years are determined to be nonhazardous (see paragraph (b)(6)(ii) of this section), then the annual testing requirements for your wastes are suspended.

(ix) After suspension of the annual testing requirements for your wastes, if your paint manufacturing, formulation, or waste treatment processes are significantly altered (i.e., if it could result in significantly higher levels of the constituents of concern for K179 or K180), then you must resume annual testing for your wastes. In order to again suspend the annual testing requirements for your wastes, the requirement under paragraph (b)(3)(viii) of this section has to be met.

(4) *Nonhazardous determination for wastes based on knowledge.* If the total annual quantity of paint manufacturing wastes your facility generates is 40 metric tons or less for waste solids or 100 metric tons or less for waste liquids, you can use knowledge of the wastes (e.g., knowledge of constituents in wastes based on existing sampling and analysis data and/or information about raw materials used, production processes used, and degradation products formed) to conclude that concentrations for the constituents of concern in the wastes are below the listing levels.

(5) *Waste holding and handling.* During the interim period, from the point of generation to completion of hazardous waste determination, you are responsible for storing the wastes properly. If the wastes are determined to be hazardous and you are not complying with the Subtitle C storage requirements during the interim period, you are subject to an enforcement action for improper storage.

(6) *Hazardous or nonhazardous determination for wastes at the point of generation.* You must make a hazardous or nonhazardous determination for your wastes at the point of generation based on the test data and/or knowledge (see nonhazardous determination for wastes under paragraphs (b)(3) and (b)(4) of this section).

(i) *Hazardous determination.* If any of the waste being evaluated at the point of generation contains any of the constituents in the applicable list under paragraph (b)(6)(iii) of this section at a concentration equal to or greater than the hazardous level set for that constituent, the waste is a listed hazardous waste and subject to all applicable RCRA Subtitle C hazardous waste requirements.

(ii) *Nonhazardous determination.* If none of the waste being evaluated at the point of generation contains any of the constituents in the applicable list under paragraph (b)(6)(iii) of this section at concentrations equal to or greater than the hazardous levels set for these constituents, the waste is determined to be nonhazardous.

(iii) *Hazardous (listing) levels.* All concentrations in the waste for any constituents identified in this paragraph (b)(6)(iii) that are equal to or greater than the following levels:

CONSTITUENTS AND CONCENTRATION LEVELS OF CONCERN FOR K179, PAINT MANUFACTURING WASTE SOLIDS

Constituent	Chemical abstracts No.	Concentration levels (mg/kg)
Acrylamide	79–06–1	310
Acrylonitrile	107–13–1	43
Antimony	7440–36–0	2,300
Methyl Isobutyl Ketone	108–10–1	73,000
Methyl Methacrylate	80–62–6	28,000

CONSTITUENTS AND CONCENTRATION LEVELS OF CONCERN FOR K180, PAINT MANUFACTURING WASTE LIQUIDS

Constituent	Chemical abstracts No.	Concentration levels (mg/kg)
Acrylamide	79–06–1	12
Acrylonitrile	107–13–1	9.3
Antimony	7440–36–0	390
Methylene chloride	75–09–2	4500
Ethylbenzene	100–41–4	11,000
Formaldehyde	50–00–0	82,000
Methyl Isobutyl Ketone	108–10–1	340
Methyl Methacrylate	80–62–6	2,100
N-Butyl Alcohol	100–42–5	41,000
Styrene	100–42–5	4,600
Toluene	108–88–3	1,200
Xylene (mixed isomers)	1330–20–7	3,900

(7) *Hazardous or nonhazardous waste determination for wastes after treatment.* If wastes that have been determined to be K179 listed hazardous waste are treated to below hazardous levels, you, as the waste generator or treater, may make a determination that the residue of the treatment process is nonhazardous by applying the procedures described for wastes at the point of generation, in paragraphs (b)(1) through (b)(4) of this section, to the treated waste. However, the residue remains subject to the LDR treatment standards for K179 as appropriate.

(c) *Record keeping requirements for generators who have determined their wastes to be nonhazardous.* You must keep records documenting the total annual quantity of paint manufacturing waste solids and liquids you generate from tank and equipment cleaning operations that use solvents, water, and/or caustic; emission control dusts or sludges; wastewater treatment sludges and off specification product. If your annual generation of paint manufacturing wastes exceeds 40 metric tons for waste solids or 100 metric tons for waste liquids, you must also keep the following records on-site for the most recent three years of testing (from the effective date of the final rule):

(1) The documentation supporting a determination that wastes are nonhazardous based on knowledge that they do not contain any of the constituents of concern.

(2) If the wastes are determined to be nonhazardous based on testing, then the following records must be kept:

(i) The sampling and analysis plan used for collecting and analyzing samples representative of the wastes, including detailed sampling methods used to account for spatial and temporal variability of the wastes, and sample preparative, cleanup (if necessary) and determinative methods.

(ii) The sampling and analyses data (including QA/QC data) and knowledge (if used) that support a nonhazardous determination for the wastes.

(4) If storing or treating liquid paint wastes on-site in tanks or containers prior to off-site disposal, the documentation showing that the liquid paint manufacturing wastes will be stored or treated exclusively in tanks or containers off-site before discharge by a facility to a POTW or discharge under an NPDES permit.

7. Appendix VII to Part 261 is amended by adding the following waste streams in alphanumeric order (by the first column) to read as follows.

Appendix VII to Part 261—Basis for Listing Hazardous Waste

EPA hazardous waste No.	Hazardous Constituents for which listed
* * *	* * * *
K179	Acrylamide, Acrylonitrile, Antimony, Methyl Isobutyl Ketone, Methyl methacrylate
K180	Acrylamide, Acrylonitrile, Antimony, Methylene Chloride, Ethylbenzene, Formaldehyde, Methyl Isobutyl Ketone, Methyl Methacrylate, N-Butyl Alcohol, Styrene, Toluene, Xylene (mixed isomers)
* * *	* * * *

* * * * *

8. Appendix VIII to Part 261 is amended by adding in alphabetical sequence of common name the following entries:

Appendix VIII to Part 261—Hazardous Constituents

Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
* * *	* * *		*
n-Butyl alcohol	1-Butanol	71–36–3	U031
* * *	* * *		*
Ethyl benzene	Same	100–41–4	
* * *	* * *		*
Methyl isobutyl ketone	4-Methyl-2-pentanone	108–10–1	U161
* * *	* * *		*
Styrene	Ethenylbenzene	100–42–5	
* * *	* * *		*
meta-Xylene	1,3-Dimethylbenzene	108–38–3	
ortho-Xylene	1,2-Dimethylbenzene	95–47–6	
para-Xylene	1,4-Dimethylbenzene	106–42–3	
Xylenes—mixed isomers (sum of o-, m-, and p-xylene concentrations).	Dimethylbenzene	1330–20–7	U239
* * *	* * *		*

* * * * *

PART 268—LAND DISPOSAL RESTRICTIONS

9. The authority citation for part 268 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, and 6924.

Subpart C—Prohibitions on Land Disposal

10. Section 268.20 is added and §§ 268.21 through 268.29 are added and reserved to subpart C to read as follows:

§ 268.20 Waste specific prohibitions—paint production wastes.

(a) Effective [Insert date six months from date of publication of final rule], the wastes specified in 40 CFR part 261 as EPA Hazardous Wastes Numbers K179, and K180, soil and debris contaminated with these wastes, radioactive wastes mixed with these wastes, and soil and debris contaminated with radioactive wastes mixed with these wastes are prohibited from land disposal.

(b) The requirements of paragraph (a) of this section do not apply if:

(1) The wastes meet the applicable treatment standards specified in Subpart D of this part;

(2) Persons have been granted an exemption from a prohibition pursuant to a petition under § 268.6, with respect to those wastes and units covered by the petition;

(3) The wastes meet the applicable treatment standards established pursuant to a petition granted under § 268.44;

(4) Hazardous debris has met the treatment standards in § 268.40 or the alternative treatment standards in § 268.45; or

(5) Persons have been granted an extension to the effective date of a prohibition pursuant to § 268.5, with respect to these wastes covered by the extension.

(c) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in § 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains regulated constituents in excess of the applicable subpart D levels, the waste is prohibited from land disposal, and all requirements of this part 268 are applicable, except as otherwise specified.

11. In § 268.40, the Table of Treatment Standards is amended by adding entries to F039 in alphabetical order and by adding in alphanumeric order new entries for K179 and K180 to read as follows:

§ 268.40 Applicability of treatment standards.

TREATMENT STANDARDS FOR HAZARDOUS WASTES

[Note: NA means not applicable]

Waste code	Waste description and treatment/regulatory subcategory [1]	Regulated hazardous constituent		Wastewaters	Nonwastewaters
		Common name	CAS [2] No.	Concentration in mg/L[3], or Technology Code [4]	Concentration in mg/kg [5] unless noted as "mg/L TCLP", or Technology Code [4]
	* * *	*	*	*	*
F039	Leachate (liquids that have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under Subpart D of this part. (Leachate resulting from the disposal of one or more of the following EPA Hazardous Wastes and no other Hazardous Waste retains its EPA Hazardous Waste Number(s): F020, F021, F022, F026, F027, and/or F028.)	* * * * * * *			
		Acrylamide	79–06–1	19	23
		* * * * * * *			
		Styrene	100–42–5	0.028	28
		* * * * * * *			
	* * *	*	*	*	*
K179	Paint manufacturing waste solids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph § 261.32 (b)(6)(iii) at a concentration equal to or greater than the hazardous level set for that constituent in paragraph § 261.32(b)(6)(iii). Paint manufacturing waste solids are: (1) waste solids generated from tank and equipment cleaning operations that use solvents, water and or caustic; (2) emission control dusts or sludges; (3) wastewater treatment sludges; and (4) off-specification product. Waste solids derived from the management of K180 by paint manufacturers would also be subject to this listing. Waste liquids derived from the management of K179 by paint manufacturers are not covered by this listing, but such liquids are subject to the K180 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph § 261.32(b)	Acrylamide	79–06–1	19	23
		Acrylonitrile	107–13–1	0.24	84
		Methyl isobutyl ketone	108–10–1	0.14	33
		Methyl methacrylate	80–62–6	0.14	160
		Antimony	7440–36–0	1.9	1.15 mg/L 0 TCLP
K180	Paint manufacturing waste liquids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph § 261.32(b)(6)(iii) at a concentration equal to or greater than the hazardous level set for that constituent in paragraph § 261.32 (b)(6)(iii) unless the wastes are stored or treated exclusively in tanks or containers prior to discharge to a POTW or under a NPDES permit. Paint manufacturing liquids are generated from tank and equipment cleaning operations that use solvents, water, and/or caustic. Waste liquids derived from the management of K179 by paint manufacturers would also be subject to this listing. Waste solids derived from the management of K180 by paint manufacturers are not covered by this listing, but such solids are subject to the K179 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph § 261.32(b)	Acrylamide	79–06–1	19	23
		Acrylonitrile	107–13–1	0.24	84
		n-Butyl alcohol	71–36–3	536	2.6
		Ethyl benzene	100–41–4	0.057	10
		Formaldehyde [13]	50–00–0	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
		Methylene chloride	75–09–2	0.089	30
		Methyl isobutyl ketone	108–10–1	0.14	33
		Methyl methacrylate	80–62–6	0.14	160
		Styrene	100–42–5	0.028	28
		Toluene	108–88–3	0.080	10
		Xylenes—mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330–20–7	0.32	30
		Antimony	7440–36–0	1.9	1.15 mg/L 0 TCLP
* * * * *	* *				

* * * * *

Footnotes to Treatment Standard Table 268.40.

[1] The waste descriptions provided in this table do not replace waste descriptions in 40 CFR Part 261. Descriptions of Treatment/Regulatory Subcategories are provided, as needed, to distinguish between applicability of different standards.

[2] CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with its salts and/or esters, the CAS number is given for the parent compound only.

[3] Concentration standards for wastewaters are expressed in mg/L and are based on analysis of composite samples.

[4] All treatment standards expressed as a Technology Code or combination of Technology Codes are explained in detail in 40 CFR 268.42 Table 1—Technology Codes and Descriptions of Technology-Based Standards.

[5] Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance with the technical requirements technical requirements of 40 CFR part 264, subpart O or 40 CFR part 265, subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 40 CFR 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

* * * * *

[13] Wastes that do not exceed the § 261.32 listing criteria for this constituent are not subject to the treatment technology requirements, but are subject to all other numerical standards.

* * * * *

12. In § 268.48 The Table—Universal Treatment Standards is amended by adding in alphabetical sequence the following entries under the headings ''organic constituents'': (The footnotes are republished without change.)

§ 268.48 Universal treatment standards.

(a) * * *

UNIVERSAL TREATMENT STANDARDS

[Note: NA means not applicable]

Regulated constituent common name	CAS[1] No.	Wastewater standard	Nonwastewater standard
		Concentration in mg/L[2]	Concentration in mg/Kg[3] unless noted in ''mg/L TCLP''
Organic Constituents:			
* * * * *		*	*
Styrene	100–42–5	0.028	28
* * * * *		*	*

* * * * * * *

[1] CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with its salts and/or esters, the CAS number is given for the parent compound only.

[2] Concentration standards for wastewaters are expressed in mg/L and are based on analysis of composite samples.

[3] Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance with the technical requirements of 40 CFR Part 264, Subpart O, or Part 265, Subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 40 CFR 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

* * * * * * *

PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

13. The authority citation for Part 271 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), and 6926.

Subpart A—Requirements for Final Authorization

14. Section 271.1(j) is amended by adding the following entries to Table 1 in chronological order by date of publication in the **Federal Register**, and by adding the following entries to Table 2 in chronological order by effective date in the **Federal Register**, to read as follows.

§ 271.1 Purpose and scope.

* * * * *

(j) * * *

TABLE 1.—REGULATIONS IMPLEMENTING THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Promulgation date	Title of regulation	Federal Register reference	Effective date
* * *	*	*	* *
[insert date of signature of final rule].	Paint Manufacturing Listing	[insert Federal Register page numbers for final rule].	[insert effective date of final rule]
* * *	*	*	* *

TABLE 2.—SELF-IMPLEMENTING PROVISIONS OF THE SOLID WASTE AMENDMENTS OF 1984

Effective date	Self-implementing provision	RCRA citation	Federal Register reference
* * *	*	*	* *
[Insert effective date of final rule]	Prohibition on land disposal of K179 and K180 wastes.	3004(g)(4)(C) and 3004(m).	[Insert date of publication of final rule], [Insert FR page numbers].
* * *	*	*	* *

PART 302—DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION

15. The authority citation for Part 302 continues to read as follows:

Authority: 42 U.S.C. 9602, 9603, and 9604; 33 U.S.C. 1321 and 1361.

16. In § 302.4, Table 302.4 is amended by adding the following new entries in alphanumeric order at the end of the table, to read as follows. (The appropriate footnotes to Table 302.4 are republished without change.)

§ 302.4 Designation of hazardous substances.

* * * * *

TABLE 302.4.—LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES

[Note: All Comments/Notes Are Located at the End of This Table]

Hazardous Substance	CASRN	Regulatory synonyms	Statutory RQ	Statutory Code †	Statutory RCRA waste No.	Final RQ Category	Final RQ Pounds (Kg)
* *	*	*	*		*		*
K179			1*	4	K179	X	100 (45.4)
Paint manufacturing waste solids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph § 261.32 (b)(6)(iii) at a concentration equal to or greater than the hazardous level set for that constituent in paragraph § 261.32(b)(6)(iii). Paint manufacturing waste solids are: (1) Waste solids generated from tank and equipment cleaning operations that use solvents, water and or caustic; (2) emission control dusts or sludges; (3) wastewater treatment sludges; and (4) off-specification product. Waste solids derived from the management of K180 by paint manufacturers would also be subject to this listing. Waste solids derived from the management of K179 by paint manufacturers are not covered by this listing, but such solids are subject to the K180 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph § 261.32(b).							
K180			1*	4	K180	X	100 (45.4)
Paint manufacturing waste solids generated by paint manufacturing facilities that, at the point of generation, contain any of the constituents identified in paragraph § 261.32(b)(6)(iii) at a concentration equal to or greater than the hazardous level set for that constituent in paragraph § 261.32(b)(6)(iii) unless the wastes are stored or treated exclusively in tanks or containers prior to discharge to a POTW or under a NPDES permit. Paint manufacturing liquids are generated from tank and equipment cleaning operations that use solvents, water, and/or caustic. Waste liquids derived from the management of K179 by paint manufacturers would also be subject to this listing. Waste liquids derived from the management of K180 by paint manufacturers are not covered by this listing, but such liquids are subject to the K179 listing. For the purposes of this listing, paint manufacturers are defined as specified in paragraph § 261.32(b).							
* *	*	*	*		*		*

† Indicates the statutory source as defined by 1, 2, 3, and 4 below.

* * * * * * *

4—Indicates that the statutory source for designation of this hazardous substance under CERCLA is RCRA Section 3001.

1* Indicates that the 1-pound RQ is a CERCLA statutory RQ.

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